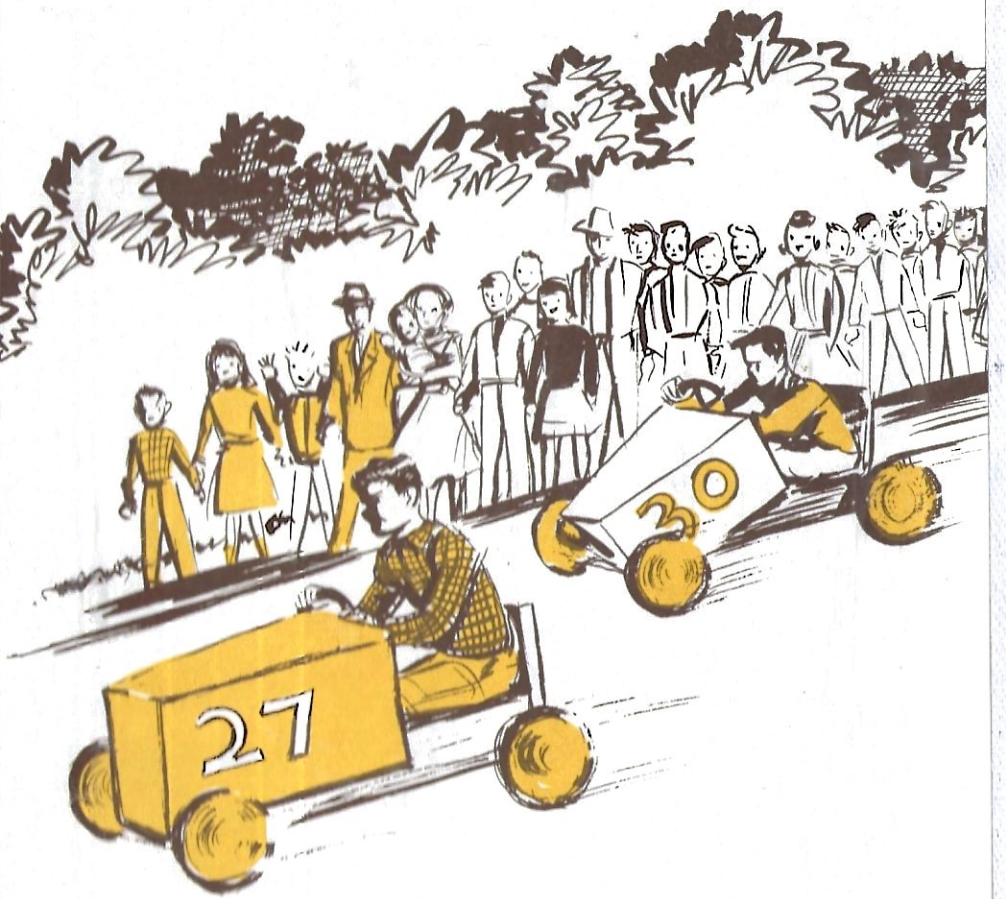
NUMBERS IN YOUR LIFE

PATTON • YOUNG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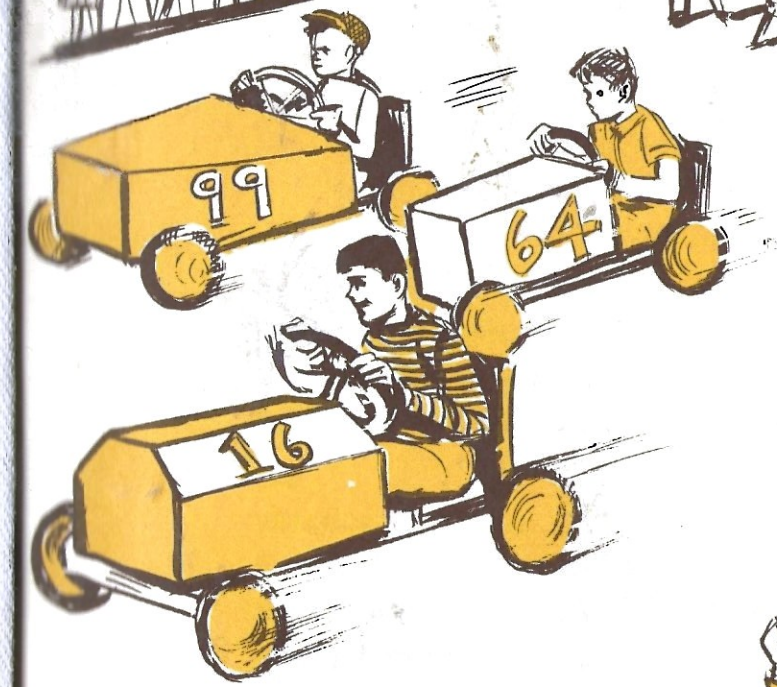
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Numbers in Your Life

Numbers at Work Series

by
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★ ★ ★ ★ ★ ★ ★

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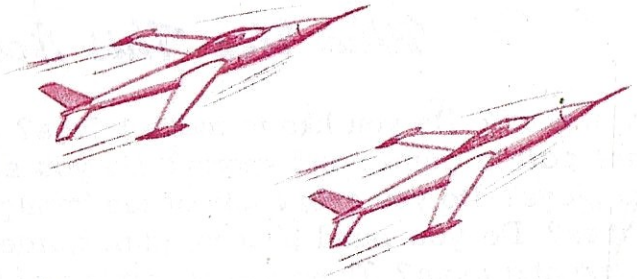
To the Boys and Girls Who Use This Book

Do you shop? Do you like to make things? Do you take part in games and sports? Do you ever present plays? Do you ever cook for the family or for parties? Do you build shacks, plan gardens, help to paint a room? These are only a few of the activities in which you must use arithmetic.

This book was written just so you can have more fun and satisfaction from many of the things you do at home and at school. It is filled with the arithmetic you must know to take a big part in all the activities of every day.

Try hard this year to help yourself become better and better in arithmetic. This book will help you review all that you learned last year. It will teach you more about the things you already know and many things that are new and useful.

If you miss an example or a problem, ask yourself, "Why?" The answer may be that you did not copy the figures correctly. It may be that you did not really learn a number fact. It may be that you did not read carefully. Whatever the reason, correct your error before going on. Good foundations make good houses. Be a careful workman in arithmetic. You will be happy you took the trouble!



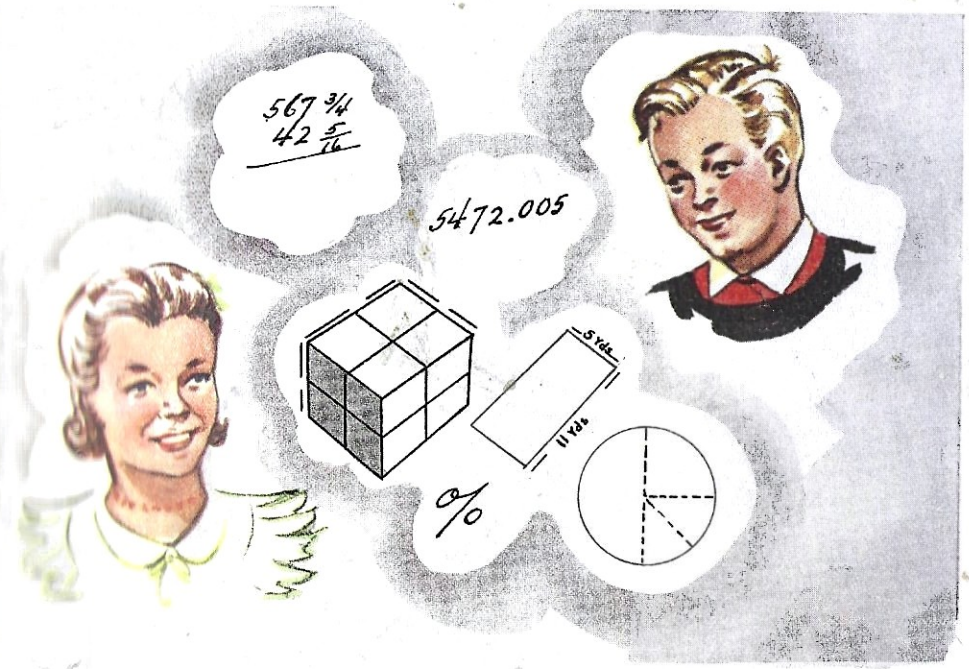
Your Chart

Probably ever since you learned about percentage last year, you have been finding what per cent of each test you had correct in all of your subjects. Your aim, no doubt, has been to get as many 100%'s as you could in this worth-while competition with yourself.

This year, keep a percentage chart for every arithmetic test you take. Be as careful and as sure in your work as a jet pilot is in his. Try for a better score each time.

Copy the chart started for you below. Add more rows, putting in the numbers of the rest of the pages marked with a jet plane. Record what per cent of every test in arithmetic you have correct.

Test on page	37	41	50	73	117	125	141	147
Per cent correct								



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The Freedom Pledge

I am an American. A free American.

Free to speak — without fear,

Free to worship my own God,

Free to stand for what I think right,

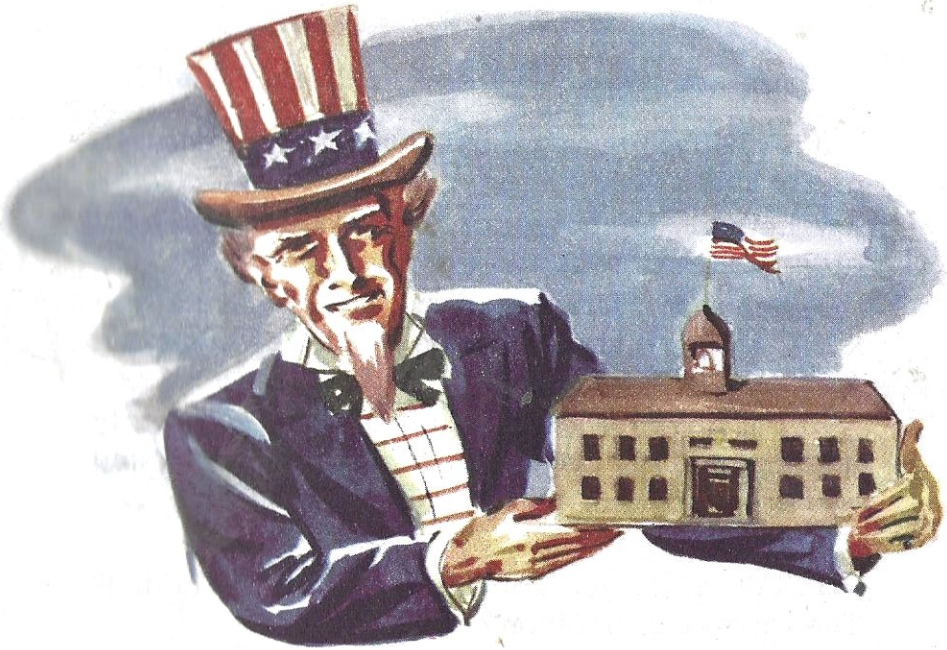
Free to oppose what I believe wrong,

Free to choose those who govern my country.

This heritage of Freedom I pledge to uphold

For myself and all mankind.

Unit 1



America, Your Home

Rejoice! Your land is the land of the free.

Your life lies before you. You are free to use it as you wish. Roads stretch out in all directions. Follow the one you choose.

Your country's schools are working to prepare you for your journey. To travel any road of life with even a fair share of success, you must KNOW.

Take your school work as a gift from America. Store all you can in your memory. That is packing valuables for your journey through life.

On any road you follow, you will need arithmetic.

Let's each pledge to make the best use of the opportunities America gives us.

Begin with this year's work in arithmetic.

The Plan

It is always fun to get out stored-away treasures, and to check their value.

Whether you know it or not, your knowledge of arithmetic is a treasure, a great treasure.

In this book let's recall and review what you know about arithmetic, and let's add new facts and new uses wherever we can.

If you find you have forgotten or do not clearly understand any single thing, stop right here and learn it now.

Take addition first.

1. What do you call the figures to be added? The answer in addition?

2. What do you mean by "carrying" when you add?

3. Make a list of things you do in which you use addition.

4. Make up a good addition problem for the class to work.

Now subtraction.

5. Write the example, 1289—794. Work it, and write each of the terms, **minuend, subtrahend,** and **remainder,** after the correct number.

6. Explain what you did when you needed to subtract 9 from 8 in Example 5.

7. When you see such questions asked as, how much longer, how much shorter, how much less, how much more, or what is the difference, what do you do to get the answer?

The 100 Addition and 100 Subtraction Facts

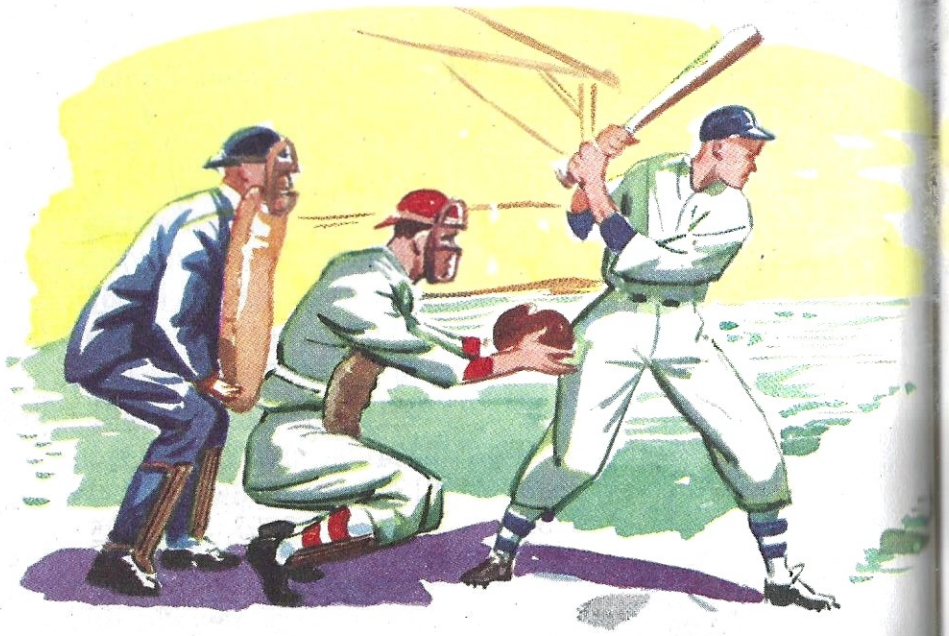
Add down and check by adding up.

	a	b	c	d	e
1.	637	445	380	924	248
	752	263	508	147	740
	110	323	154	300	667
2.	100	805	706	612	550
	801	390	841	780	965
	998	779	261	889	145
3.	122	6513	4334	1400	6214
	421	9689	8134	2563	6730
	142	2188	1712	3350	1025
	551	3212	3254	4346	3126
	12				
	22				

Subtract and check by adding the remainder to the subtrahend. The sum should equal the minuend.

4.	13865	11814	15967	15119	16911
	5773	3339	9090	7620	7214
5.	12309	96209	14681	13039	30836
	6634	32608	5167	8189	17064
6.	10003	16614	15723	78480	67538
	5882	5594	7140	40332	3192
7.	12268	13996	17735	14572	86563
	2923	4748	9040	6651	70948
8.	11804	10510	34442	18242	97288
	8165	4455	26015	8780	26729
9.	10478	17525	86358	53093	78431
	4195	8218	85616	23963	39735

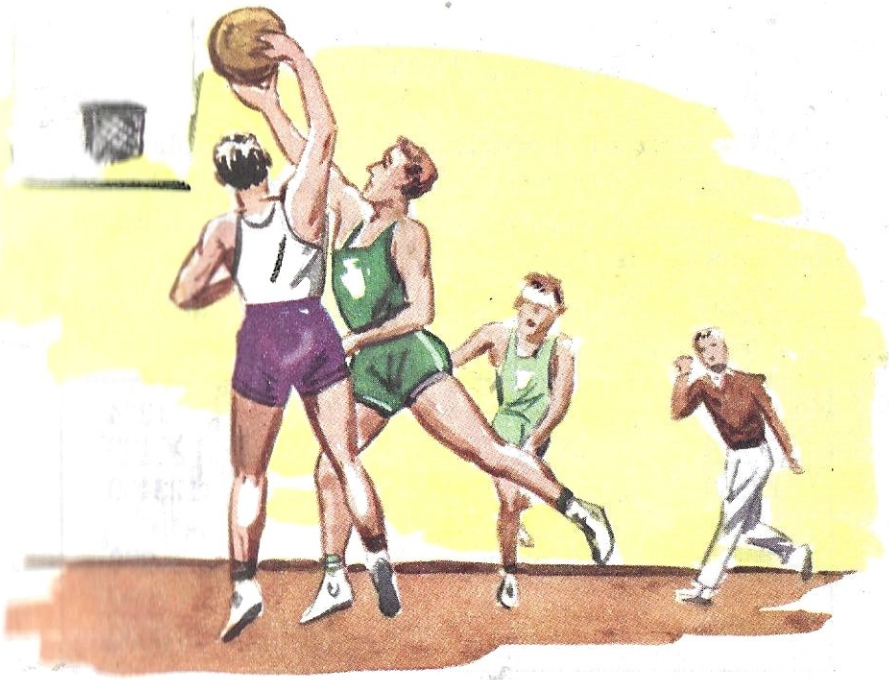
More practice on page 359.



Sports-Loving America

Watch people reading a newspaper on a bus or train. Many of them are reading the sports page. Listen to the radio or watch television during the football and baseball seasons. Watch the crowds streaming out of a sports arena after a basketball game. No doubt about it, we Americans enjoy sports. Some of our best-loved heroes are athletes.

1. The great Babe Ruth made 60 home runs one baseball season; 54, the next; 46, the next; and 49, the fourth season. How many home runs did he make in the four seasons? How many more home runs did he make in the first season than in the fourth?



2. In the 1951 basketball Western Conference games, Illinois scored 989 points and Indiana scored 898. Find the difference in points.

3. Here are the points scored by champions at the 1951 American Bowling Congress games: Lee Jouglard, 775; Charles Polich, 739; Cecil Potts, 738. Find the total points of these three champions.

The James E. Sullivan Memorial Trophy is awarded each year to the amateur athlete who has done the most to set an example for good sportsmanship. Here are the points made by some of the winners.

4. In 1948, Robert Mathias scored 1491 points; in 1950, Fred Wilt scored 1197. Find the difference.

Recalling Multiplication

Make sure you know the terms of multiplication. The number that we multiply is the **multiplicand.** The number by which we multiply is the **multiplier.** The answer is the **product.**

1. Study these examples. Then, tell how each figure in each product was found.

3145	467	1234	1234
×4	×56	×568	×100
12580	2802	9872	123400
	2335	7404	
	26152	6170	378
		700912	×1000
			378000

2. Explain why the 2802 in the second example is called a **part** or **partial product.**

3. Where do you place the right-hand figure of a partial product?

4. Tell how you multiply a number by 10; by 100; by 1000.

5. By what must you multiply 1000 to make it equal 1,000,000?

6. Which would be easier, to multiply 15 by 1349 or 1349 by 15? Would you get the same product either way? Work the example the easier way.

7. Look at this example: $15 \times 25 = 375$. Then give one other multiplication example and two division examples using the same numbers.

The 100 Multiplication Facts

All of the 100 multiplication facts are in these examples. Multiply. Prove or **check** by multiplying the multiplier by the multiplicand.

	a	b	c	d	e
1.	4698	9875	4782	1509	8074
	24	30	56	65	89
2.	1753	5236	4085	7546	5396
	57	36	79	18	97
3.	1203	8641	1420	7546	1239
	204	150	137	402	891
4.	2564	6089	8752	3976	342
	206	324	105	980	497

5. If you missed a multiplication fact, work out what it should be by addition and learn the answer.

Multiply and check. Look out for the zeros. They are tricky, you know, unless you are very careful.

6.	614	506	715	809	545
	403	59	650	503	300
7.	6000	8007	4300	3004	4056
	342	29	820	608	600
8.	6540	7070	8234	9809	4567
	1345	4605	1007	1278	9010

More practice on page 360.

People in the United States

Every ten years, since 1790, a census or record has been taken of the number of people living in our country.

A recent census tells us that 94,092,000 people live in our cities and towns and that 53,453,000 people live in the country. You see that these figures have been rounded to the nearest thousand.

1. Find how many more people live in cities and towns than in the country.

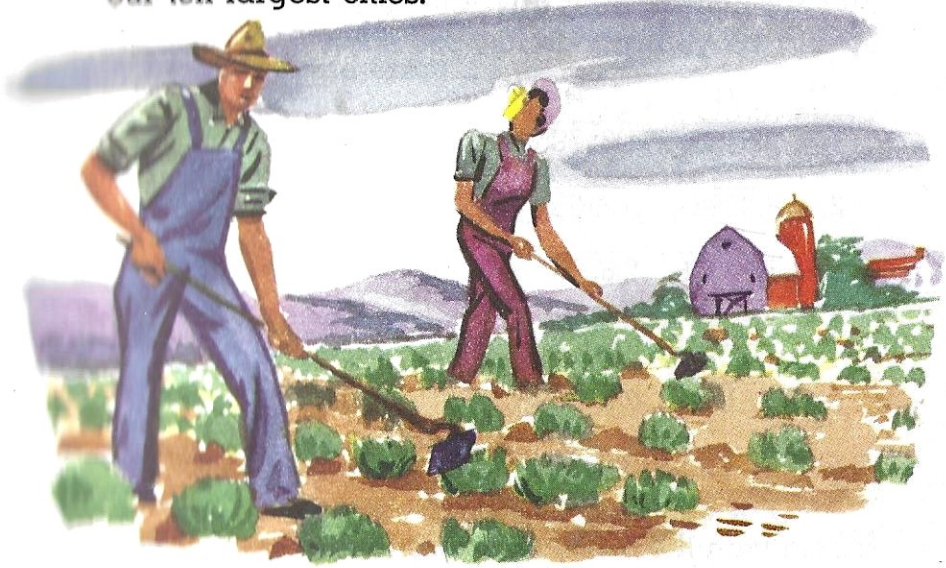
2. Round the city and country figures to the nearest million.

Here is the number of people living in each of our 10 largest cities.

3. Read each of the numbers aloud. Then round each to the nearest thousand; to the nearest million.

New York City, N. Y.	8,573,403
Chicago, Ill.	3,606,436
Philadelphia, Pa.	2,064,794
Los Angeles, Calif.	1,957,692
Detroit, Mich.	1,838,517
San Francisco, Calif.	1,141,329
Baltimore, Md.	940,205
Cleveland, O.	905,636
St. Louis, Mo.	852,623
Washington, D. C.	797,670

4. Find the total number of people who live in our ten largest cities.



More practice on page 360.

Recalling Short Division

When you divide the short way, you **think** your work and write only the answer figures.

Do you remember the terms which name the three numbers in a short division example? On your paper, write each name and explain to which number it belongs.

	1353	quotient
divisor	5)6765	dividend

Study the boxed-in example. Explain how each figure in the quotient was found.

The 90 Division Facts

Divide, and prove by multiplying your quotient by your divisor. Add any remainder. Your answer should be your dividend. Use short division.

	a	b	c	d	e
1.	2)5496	1)35796	5)4050	3)30918	4)8416
2.	6)2292	5)2155	7)6587	9)4887	1)14082
3.	8)13256	2)6018	4)1220	6)6042	7)5782
4.	9)8829	6)5676	8)2592	2)1122	5)48530
5.	3)6144	7)37590	9)2340	4)2724	8)78480
6.	4)36028	3)2925	5)2510	6)6450	9)6570

7. For each fact missed, try a new division example with the missed fact used in it.

More practice on page 361.

Roman Numerals

Review what you have learned about Roman numerals by studying this chart:

I	II	III	IV	V	VI	VII	VIII	IX
1	2	3	4	5	6	7	8	9
X	XX	XXX	XL	L	LX	LXX	LXXX	XC
10	20	30	40	50	60	70	80	90
C	CC	CCC	CD	D	DC	DCC	DCCC	CM
100	200	300	400	500	600	700	800	900
M								
1000								

1. Find proof in the chart that a letter repeated repeats its value.

2. Show where a smaller number before a larger number means that the smaller number is subtracted from the larger.

3. Do you find V, L, or D repeated or subtracted?

4. Is X ever placed before L or C?

5. Is C ever placed before D or M?

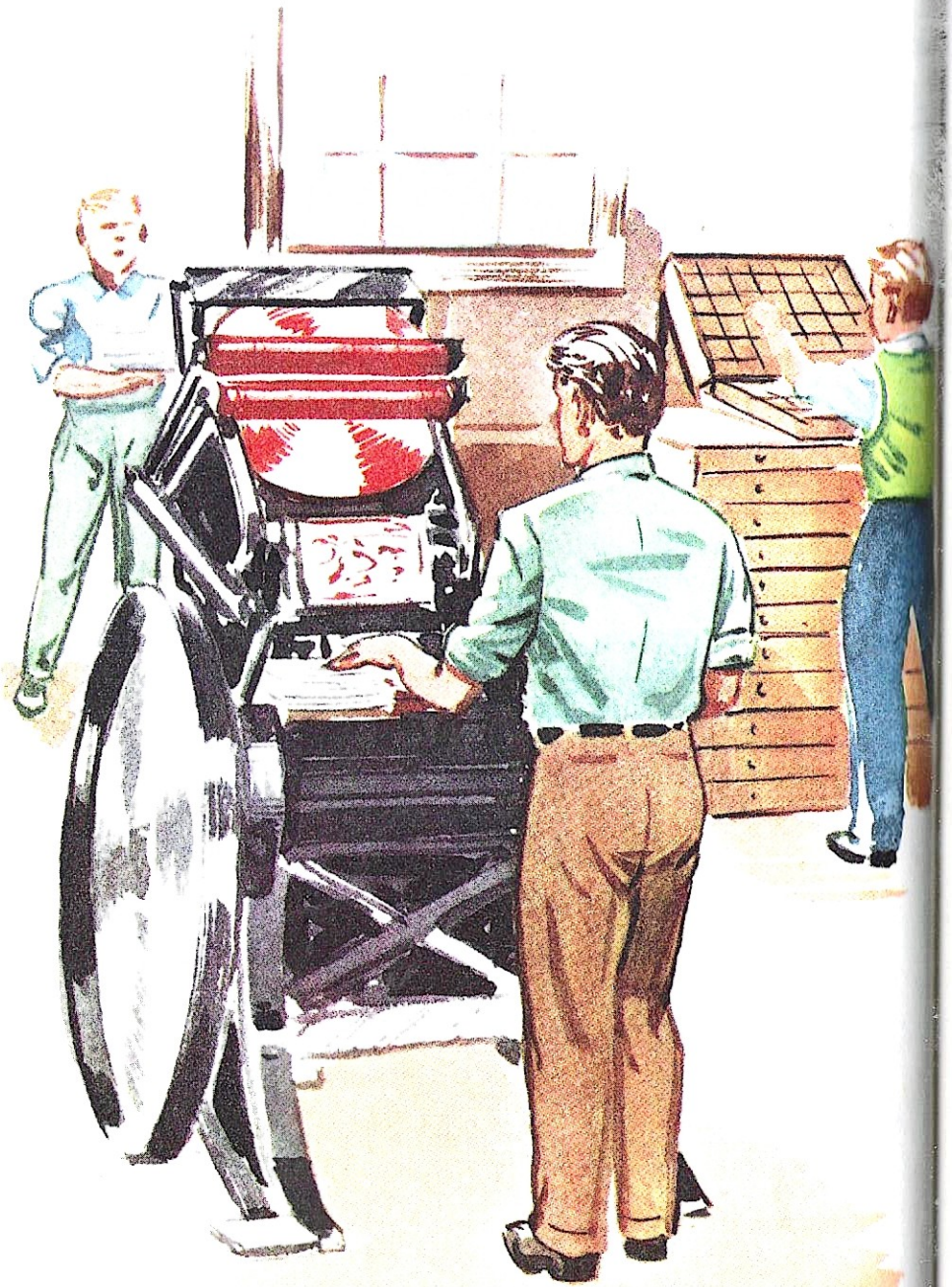
Read these Roman numerals:

6. XIV CMXCIX LXI MMI DCL DCXXIV MDCCLXXVI.

Write these as Roman numerals:

	a	b	c	d	e	f	g	h	i
7.	13	15	21	52	86	64	103	209	707
8.	19	26	37	48	72	99	305	1807	1954

More practice on page 361.



In the Steps of Ben Franklin

We all know that when Franklin was a young man, he was a printer. The boys and girls remember this as they work in the printing class to put out their school newspaper, **School Days.**

1. Martin Engel is the **editor** of **School Days.** He reads the articles, news, and poems left in the printing office by the pupils. One day Martin read 45 papers, out of which he chose 24 for printing. How many were left for another printing?

2. A few of the boys take turns setting the material into type whenever they have some free time. Cary Barton set 31 lines of type before class; 14 lines during a study period; and 25 lines during a printing-class period. What was his total?

3. Amy Tilden is a **proofreader.** She corrects the printers' errors when she reads what they have printed. The printers then correct the mistakes in their type. For one newspaper issue, there were 13 mistakes to be corrected by the printers; for another issue, there were 21. What was the average for the two issues?

4. William Coyle, Ted Lowe, and Bert Fowler are the boys who carefully put the type back in the special containers when the paper has been printed. Each letter goes in its own place, the a's with the a's, the b's with the b's, and so on. Yesterday each boy put back 205 letters. How many pieces of type was that altogether?

Recalling Long Division

Study the following hints about long division. Then tell how each quotient figure is found in the four examples in the box.

a. When the second figure of the divisor is 1, 2, 3, 4, or 5, use the first figure of the divisor as the trial divisor.

b. When the second figure of the divisor is 6, 7, 8, or 9, increase the first figure of the divisor by 1 for use as the trial divisor.

c. When a trial quotient figure is too large, try the next smaller figure. When a trial quotient figure is too small, try the next larger figure.

d. When both the divisor and the dividend end in one or more zeros, cancel the same number of zeros at the end of both numbers, and then divide.

13 r 20	74 r 11	205	140
34)462	67)4969	273)55965	600)84000
34	469	546	
122	279	1365	
102	268	1365	
20	11		

Divide and prove.

	a	b	c	d
1.	53)2968	72)6798	44)3872	81)5517
2.	29)1695	68)3604	75)5100	17)1836
3.	55)39028	36)32508	47)46013	83)41002
4.	600)19800	710)42600	400)26800	135)99900

More practice on page 362.

Practicing Long Division

Divide and prove.

	a	b	c	d
1.	33)2783	92)5980	65)2405	47)3572
2.	13)66768	29)29261	25)19250	61)45994
3.	38)18449	18)19566	48)24870	36)39477
4.	55)40810	34)41956	73)39566	84)44905
5.	82)72652	64)22152	95)83220	63)55440
6.	41)31201	57)45201	46)48622	66)486288
7.	79)53404	84)179760	67)261233	312)78936

Divide and prove.

	a	b	c
8.	49)39053	11)20108	35)22925
9.	77)74228	19)87229	41)371747
10.	42)85260	96)41932	71)763250
11.	65)64025	28)270916	87)59827
12.	93)37665	46)46184	92)184092
13.	56)545048	621)53406	910)48230
14.	713)41354	387)38019	899)79112
15.	638)40832	284)19383	775)45725

More practice on page 362.

The Typing Club

Mary Louise has a typewriter. With all her class chums, she has organized a club to earn money for "adopting" a war orphan in Korea. Typing papers and reports their school friends write is one of the ways they earn money.

1. Mary Louise types 24 words a minute. How many minutes would it take to finish typing John's story, which is 288 words long?

2. Karen typed a report for the Student Government. She put 212 words on each page. There were 11 pages. How many words were there on all the pages?

3. In a four-week month, the pupils and teachers gave 124 pieces of work to be typed. Find the average for one week.

4. One week the club typed 15 pages; the next, 19; the next, 21; and the next, 25. What was the average number of pages typed each week?

5. Shirley typed a story written by the eighth grade. There were 2150 words in the story. How many minutes did it take to type it if Shirley types 30 words a minute?

6. Mary Louise types 24 words a minute; Karen, 24; and Shirley, 30. What is the average typing speed of this group?

United States Money

1. On your paper write the dollar sign.

2. What do you call the point you place between the dollars and cents when you write ten dollars and eighty cents in figures?

3. When you have several sums of money to add, how do you write them?

4. Where do you place the decimal point in the sum?

5. Explain how you write the dollars and cents in a subtraction example.

6. Where do you place the decimal point in your remainder?

7. When you multiply dollars and cents by a whole number, do you point off two decimal places in your product to show cents?

8. When you divide dollars and cents by a whole number, do you point off two decimal places in your quotient to show cents?

9. Write and work a problem in which you must add dollars and cents to find the sum.

10. Write and work a subtraction problem, using dollars and cents to find the remainder.

11. Write and work a multiplication problem and a division problem with dollars and cents in both.

Working with United States Money

Add and check.

	a	b	c	d
1.	$ 1.98	$36.78	$78.09	$19.88
	79.75	7.19	9.28	69.44
	36.90	.73	97.19	97.59
	64.22	80.93	9.07	28.75
	56.10	7.89	28.62	55.34
	6.35	88.59	9.17	69.37
2.	$ 32.95	$ 97.78	$904.67	$5761.58
	9.74	829.38	849.63	7166.48
	46.27	586.96	279.36	.52
	869.85	975.68	54.88	7495.69
	64.41	552.51	764.77	8.97

Subtract and check.

3.	$115.63	$965.79	$899.14	$767.42
	67.65	903.93	400.15	396.62
4.	$665.70	$518.24	$814.00	$912.70
	429.00	30.46	338.62	221.46

Multiply and check.

5.	$21.03	$39.45	$12.58	$31.04
	41	18	87	62
6.	$ 7.98	$ 5.13	$ 6.97	$10.25
	670	346	107	509

Divide and check. Use short division.

7.	8)$65.84	9)$78.03	7)$104.65	6)$165.06
8.	3)$1728.30	4)$1992.04	5)$2716.05	2)$1965.48

More practice on page 362.

Electricity at Your Service

Do you know that electricity can serve in at least fifty-one ways in your home? Yet, with all the comforts electricity brings, it costs very little.

This table shows the average yearly rates for running some of the more common electric appliances if they are used in a normal, average way.

Refrigerator	$ 9.73
Washing machine	1.27
Iron	3.10
Radio	2.82
Television	8.18
Toaster	.85
Water heater	103.64
Vacuum cleaner	.71
Clock	.48

1. The Turner family have a refrigerator, an iron, and a washing machine. What does the electric company charge them for average use of all these appliances for a year? For 3 years?

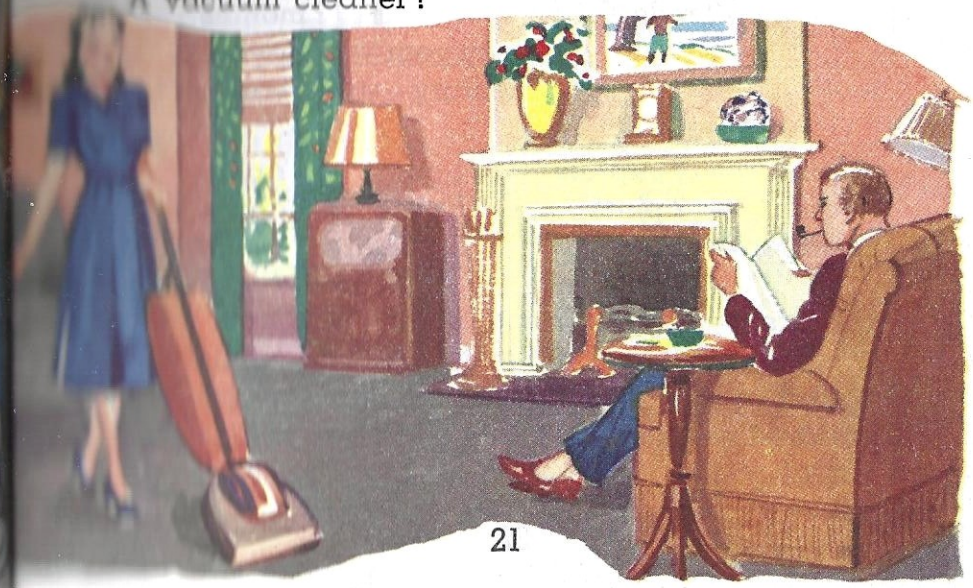
2. What would be charged to such a family for running all the appliances shown in the table one year?

3. What would be the charge for running 6 clocks for 4 years?

4. What would it cost, on the average, to use a toaster, a television set, a vacuum cleaner, and a refrigerator for a year?

5. Mr. Allen's water heater has been used an average amount for 6 years; his radio, 3 years. Find the total amount paid for their use during this time.

6. How much does it cost for average use of a water heater during one month? A radio? A clock? A vacuum cleaner?



Try to think of one hour in any day when measures do not enter into your life. You really can't. Even if you lie in bed, your bed has length, your bedding is longer and wider than your bed, and you are just so many inches shorter than your mattress. Well then, let's be very sure we know those tables of measures we use each day. If you don't know, turn to pages 357 and 358.

Give the missing numbers and write the abbreviations.

Length

1 foot = ? inches
1 yard = ? inches, ? feet
1 rod = ? feet, ? yards
1 mile = ? feet, ? rods

Time

1 minute = ? seconds
1 hour = ? minutes
1 day = ? hours
1 week = ? days
1 year = ? days, about ? weeks, ? months
1 leap year = ? days
1 century = ? years

Liquid

1 pint = ? cupfuls
1 quart = ? pints
1 gallon = ? pints, ? quarts
1 barrel = ? gallons

Dry

1 quart = ? pints
1 peck = ? quarts
1 bushel = ? quarts, ? pecks

Weight

1 pound = ? ounces
1 hundredweight = ? pounds
1 ton = ? pounds

Counting

1 dozen = ? things
1 gross = ? things, ? dozen

1. Tell how you change a larger measure to a smaller measure.

2. Tell how you change a smaller measure to a larger measure.

Change.

3. 5 yd. to ft. | 2 gal. to pt. | 1 gross to doz.
   4 yd. to in. | 2 bu. to qt. | 1 cwt. to oz.
   2 mi. to rd. | 4 lb. to oz. | 1 mi. to ft.
   2 yr. to da. | 2 T. to lb. | 5 yr. to mo.

4. 48 qt. to pk. | 64 oz. to lb. | 640 rd. to mi.
   12 pk. to bu. | 120 in. to ft. | 8000 lb. to T.

Study these examples, and explain the steps in finding each answer.

4 yd. 2 ft. = ? ft.	55 qt. = ? gal.
4 yd. = 4 × 3 ft. = 12 ft.	55 ÷ 4 = 13 r3
12 ft. + 2 ft. = 14 ft.	55 qt. = 13 gal. 3 qt.

Find the answers.

5. 3 ft. 6 in. = ? in. | 4 bu. 3 pk. = ? pk. | 37 ft. = ? yd.
   2 wk. 4 da. = ? da. | 23 qt. = ? gal. | 45 da. = ? wk.

6. How many pint bottles can be filled from 45 gal. of tomato juice?

7. John sold 3 bu. of potatoes at 45¢ a pk. How much did he get for them?

8. A coal car holds 120,000 lb. of coal. How many tons does it hold?

More practice on page 363.

Sharing with Others

It doesn't have to be Christmas for people to give to others. Indeed, what would happen to us if our parents were kind to us only at Christmas!

You do know the table of time, surely. In working these problems let's count 4 weeks to a month.

1. Four months before the Community Chest drive, Bill put away 10¢ a week for this good cause. How much did Bill give to the Community Chest?

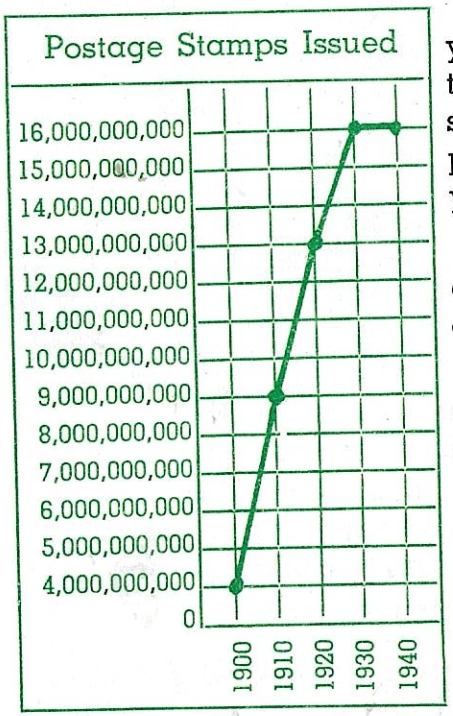
2. Barbara's Friend-in-Need Club sold hand-made pot holders so that a poor city child could have a country vacation. How much money did the girls make by selling 144 pot holders at 25¢ each?

3. Robert has no money, but he knows other ways of giving. Robert gives an hour of his time, twice a week, to read to sick folks. How many hours can he give in a year at this rate? Can you prove that this is $4\frac{1}{3}$ days of Robert's time?

4. Anne's big sister gives 2 hours twice a week to help out at a hospital nearby. If she does not miss a visit for 10 months, how many days does this girl give to others in that time?

5. Jane's baby-sitting for Mother pays her 50¢ a week. In 3 months, she earns (?) dollars. Jane uses $\frac{1}{4}$ of her three-months' pay to buy food for old Mrs. Gray. She gives to church $\frac{1}{2}$ of what is left. How much does Jane have for other charities?

We can use **line graphs** to compare such things as test marks, population figures, sales figures, temperatures, and other numbers.



This line graph shows you, in round numbers, the number of postage stamps issued by our post offices between the years 1900 and 1940.

1. How many years are shown by the width of each square?

2. The height of each square shows how many stamps?

3. How many stamps were issued in each of the years shown?

4. Between which years was there the greatest increase?

5. Between which years was there neither increase nor decrease?

6. Show by a line graph that New York City's average daily school attendance was as follows: in 1947—734,124; in 1948—747,034; in 1949—764,798; in 1950—765,283. Round the numbers to the nearest ten-thousand before starting the graph.

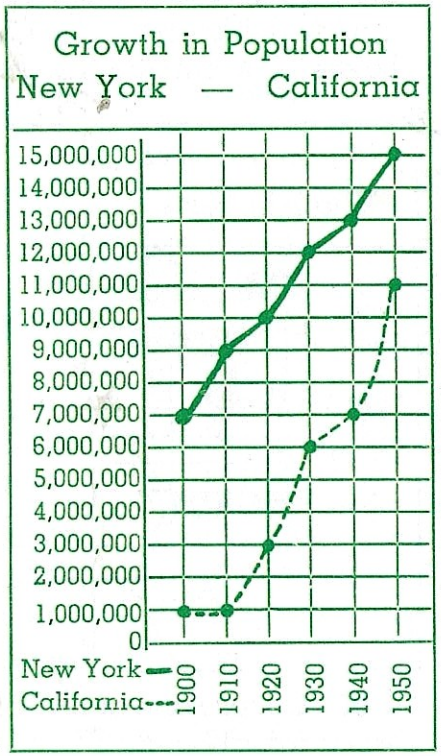
Sometimes we can show two records with a line graph.

7. What does the solid line in this graph show? The dotted line?

8. What was the difference in population between New York and California in each of the years shown?

9. For both states, find the difference between the population of 1900 and 1950.

10. Which years show the greatest rise in California? Which years show the least rise in New York? Explain the California line for the years 1900-1910.



11. Find the three periods of equal growth in New York.

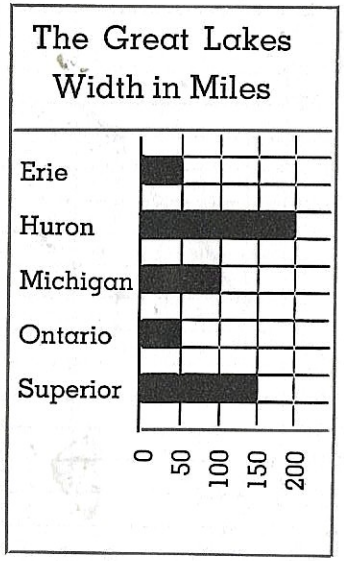
12. Use the **World Almanac** to find the population figures between 1900 and 1950 for the states of Pennsylvania and Washington. Show the two records on a line graph.

More practice on page 364.

Horizontal Bar Graph

When we want to show a comparison of quantities, heights, lengths, or weights, **bar graphs** are useful.

Here is a **horizontal** bar graph, which means that the bars are drawn across the graph. Using rounded numbers, it compares in miles the width of the Great Lakes. The numbers were rounded to the nearest fifty.



1. How much wider is Lake Huron than Lake Superior?

2. Find the difference between the widest lake and the narrowest.

3. How much narrower is Lake Ontario than Lake Huron?

4. Which lakes have the same width, according to this graph?

5. Find the total width of all of the Great Lakes.

6. Choose one of the following. Make a horizontal graph about it.

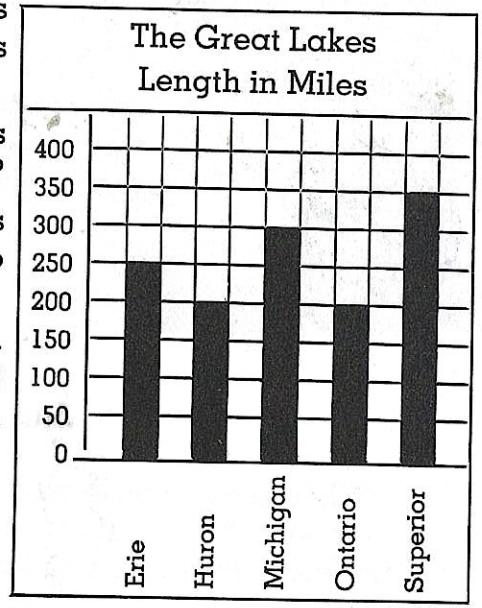
a. Your spelling marks for one week.

b. The Mississippi River is 2330 mi. long; the Missouri River is 2466 mi. long; the Rio Grande River is 1800 mi. long; and the Columbia River is 1214 mi. long.

More practice on page 364.

Vertical Bar Graph

Bar graphs can be **vertical,** too; that is, with the bars drawn up and down as in this graph. The numbers here were rounded to the nearest fifty.



1. For how many miles does each square of this graph stand?

2. How many miles long is the longest lake?

3. How many miles long is each of the two shortest lakes?

4. What is the difference in the lengths of Lake Michigan and Lake Superior?

5. What is the total length in miles of all the Great Lakes?

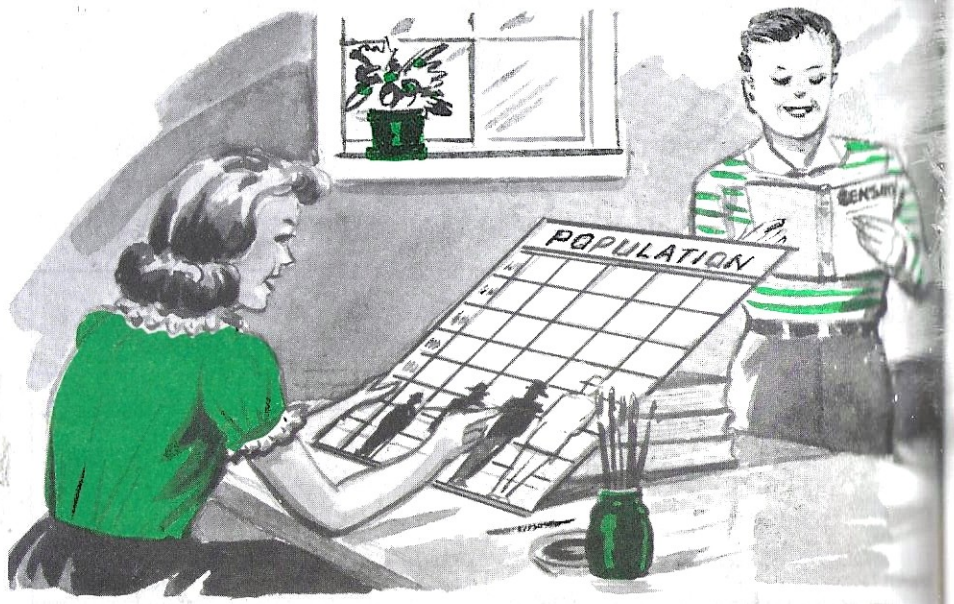
6. In the **World Almanac,** find information on one of the following subjects. Make a vertical graph about the subject you chose.

a. The number of students in ten American colleges.

b. The number of public schools in Maine, Massachusetts, New York, New Jersey, Ohio, and Indiana.

c. The number of schools for nurses in California, Washington, Texas, Georgia, and Alabama.

More practice on page 364.



Making Graphs

Choose three of these subjects. Round the given numbers. Make either a bar graph or a line graph for each subject you chose.

1. Tornadoes in the United States cost us the following property loss: 1940 — $6,015,320; 1941 — $4,492,650; 1942 — $15,268,950; 1943 — $12,198,400; 1944 — $21,594,150; 1945 — $22,069,800.

2. In 1950, there were the following numbers of people attending schools in the United States: persons 5 to 13 years old — 20,559,000; persons 14 to 17 years old — 8,008,000; persons 18 to 24 years old — 3,180,000.

3. The latest census figures show these popu-

lations for five principal Canadian cities: Montreal 1,420,057; Toronto — 729,978; Vancouver — 385,500; Winnipeg — 242,380; Hamilton — 191,720.

4. It is estimated that the following numbers of people made up our farm population during these years: 1947 — 26,147,000; 1948 — 25,093,000; 1949 — 25,104,000; 1950 — 24,335,000; 1951 — 23,276,000.

5. Here are six of Chicago's tallest buildings: Board of Trade — 605 ft.; Pittsfield — 557 ft.; Civic Opera — 555 ft.; Field — 535 ft.; One La Salle Street — 530 ft.; Morrison Hotel — 526 ft.

6. The library in Akron, Ohio, has 306,816 books; in Dallas, Texas, 190,169; in Louisville, Kentucky, 306,197; in Omaha, Nebraska, 247,077.

Study these examples and explain how each is worked:

2 ft. 9 in. +1 ft. 4 in. 3 ft. 13 in. or 4 ft. 1 in.	5 gal. 1 qt. = 4 gal. 5 qt. −3 gal. 3 qt. = 3 gal. 3 qt. 1 gal. 2 qt.	
2 lb. 5 oz. ×4 8 lb. 20 oz. or 9 lb. 4 oz.	by long division 2 hr. 25 min. 3)7 hr. 15 min. 6 1 hr. 15 min. = 75 min. 75	by short division 2 hr. 25 min. 3)7 hr. 15 min.

Add.

	a	b	c
1.	1 pk. 3 qt. 2 pk. 4 qt.	13 gal. 2 qt. 5 gal. 3 qt.	14 hr. 37 min. 3 hr. 56 min.
2.	4 yd. 2 ft. 3 yd. 1 ft. 2 yd. 1 ft.	5 bu. 3 pk. 2 bu. 5 pk. 1 bu. 4 pk.	1 mi. 1280 ft. 3 mi. 2995 ft. 1 mi. 1005 ft.

Subtract.

3.	39 lb. 6 oz. 4 lb. 5 oz.	12 hr. 14 min. 6 hr. 37 min.	34 ft. 7 in. 27 ft. 10 in.
4.	2 yr. 5 mo. 1 yr. 7 mo.	3 yr. 24 wk. 1 yr. 43 wk.	3 T. 600 lb. 1 T. 800 lb.

More practice on page 365.

Multiply.

	a	b	c
5.	2 lb. 4 oz. 3	13 gal. 3 qt. 6	5 bu. 8 qt. 12
6.	7 ft. 9 in. 8	9 da. 18 hr. 3	2 yr. 5 mo. 5

Divide.

7.	3)7 gal. 2 qt.	8)9 hr. 12 min.	15)19 lb. 11 oz.
8.	4)5 yr. 4 mo.	3)4 yd. 9 in.	3)7 bu. 3 pk. 4 qt.

9. From one tree, Bill picked 3 bu. 2 pk. of pears; from another tree, 1 bu. 3 pk.; and from a third tree, 2 bu. 1 pk. How many bushels and pecks of pears did he pick?

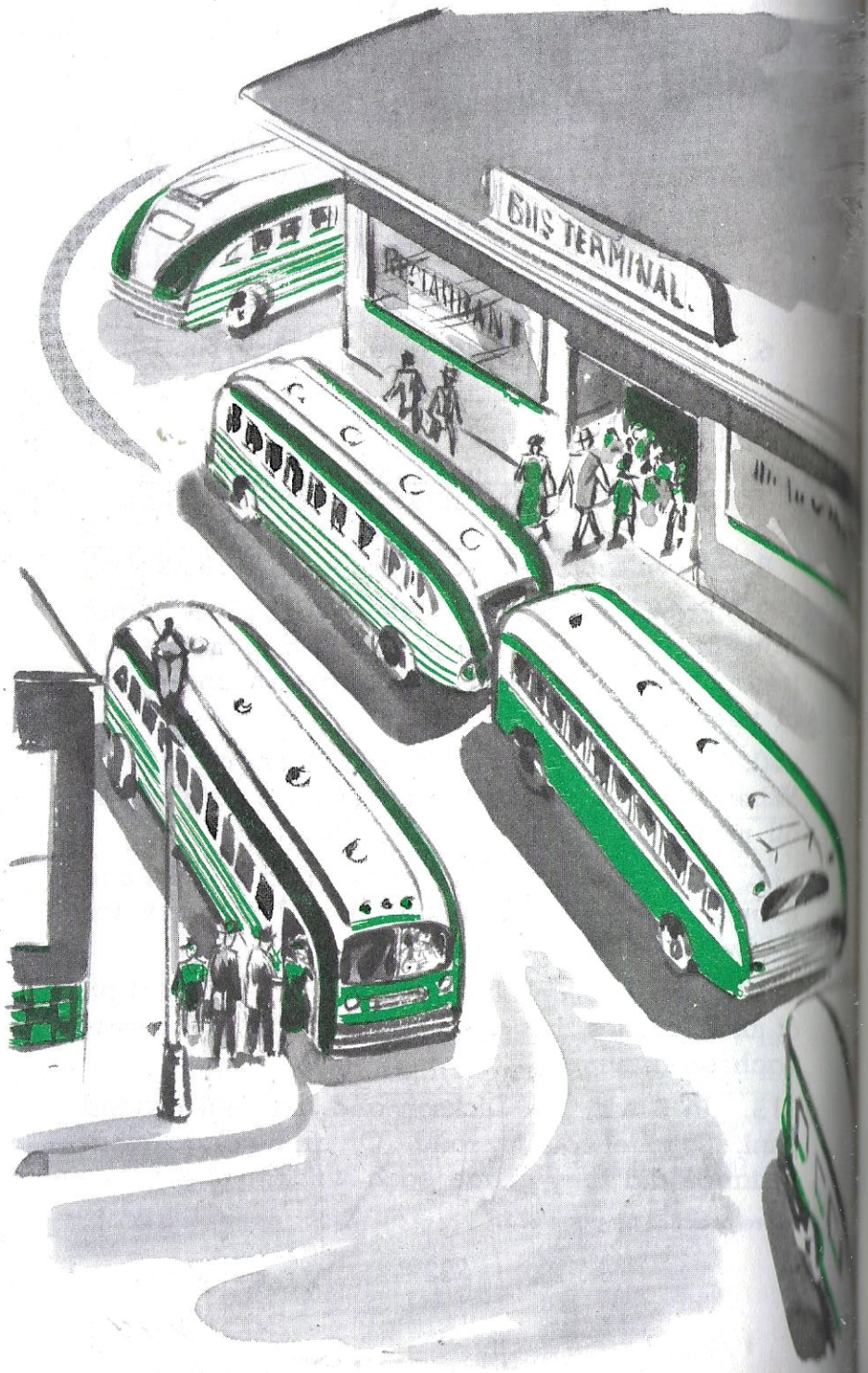
10. A 10-gallon can filled with oil sprang a leak. When the leak was discovered, only 6 gal. 3 qt. of oil remained. How much oil was lost?

11. Janet needs 2 ft. 8 in. of toweling to make one towel. How much toweling should she buy for 6 towels?

12. Jack, Bob, and Jim divided equally 10 qt. 1 pt. of blackberries that they had picked. What was each one's share?

13. In 6 wk., Mr. Dickson and his men graded 7 mi. 100 rd. of country road. On an average, what distance did they grade each week?

More practice on page 365.



Numbers and a Bus

1. Peter's brother drives a bus every day between two towns 35 miles apart. He makes 3 round trips each day. How many miles does he drive a day? How many miles does he drive in 26 days?

2. The bus seats 29 passengers when it is filled. If on a full bus each person paid $1.32 for his one-way ticket, how much money would the bus company collect?

3. A round-trip ticket costs 28¢ less than 2 one-way tickets at $1.32 each. What is the price of a round-trip ticket?

4. If a person rode both ways between the two towns once each week, how much would he save in 8 weeks by buying round-trip tickets? In a year?

5. On one trip one way there were 9 people with one-way tickets and 12 with round-trip tickets. How much did that trip bring in to the bus company?

6. How much more would the bus company collect from 29 one-way tickets than from 15 one-way tickets?

Without Pencils

1. Divide the product of 10×44 by 2.
2. Multiply the quotient of $368 \div 8$ by 100.
3. Add the remainder of $3694 - 2401$ to 4000.
4. Subtract the product of 36×2 from 84.
5. Divide the sum of $368 + 16$ by 8.
6. Multiply the remainder of $5467 - 67$ by 10.
7. Add the quotient of $545 \div 5$ to 200.
8. Subtract the sum of $17 + 117 + 3$ from 237.
9. Multiply the product of 100×24 by 10.
10. Divide the remainder of $2298 - 498$ by 9.
11. Add the product of 1000×31 to 749.
12. Subtract the quotient of $981 \div 9$ from 209.
13. Add the quotient of $1477 \div 7$ to 99.
14. Multiply the sum of $124 + 9 + 3$ by 100.
15. Divide the quotient of $2121 \div 7$ by 3.
16. Subtract the remainder of $5498 - 1399$ from 5099.
17. Add the quotient of $340 \div 10$ to 78.
18. Multiply the sum of $34 + 62 + 39$ by 1000.
19. Divide the product of 100×72 by 9.
20. Subtract the sum of $98 + 98 + 4$ from 980.

Testing Your Progress

1.
$$\begin{array}{r} \$389.75 \\ 57.86 \\ 239.57 \\ 4.64 \\ 549.02 \\ 3.59 \end{array}$$

2.
$$\begin{array}{r} \$1640.03 \\ -949.15 \end{array}$$

3.
$$\begin{array}{r} 1295 \\ \times 579 \end{array}$$

4. $127\overline{)\$932.18}$

5. $\overline{5)8 \text{ bu. } 3 \text{ pk.}}$

6. 6×17 gal. 3 qt. = ?

7. 63360 rd. = ? mi.

8. Write as an Arabic number: MDCCLXI.

9. In a recent year, Ohio produced 17,889,238 lb. of wool. Round this number to the nearest hundred thousand.

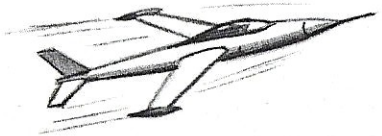
10. Traveling at an average rate of 35 mi. per hour, Mr. Dix can drive from New York to his home in 131 hr. Find how far he drives.

11. During the month of September, Mr. York spent \$73.71 for 351 gal. of gasoline. What was the price per gallon?

12. In 5 yr., a famous inventor earned \$10,000, \$14,000, \$16,000, \$22,000, and \$18,000. What was his average annual income?

13. Mr. Andrews raised 565 bu. of potatoes and shipped them to market in 100-lb. sacks. A bushel of potatoes weighs 60 lb. How many sacks did Mr. Andrews ship?

14. Larry gathered 3 pk. 2 qt. of nuts; Peter, 5 pk. 3 qt.; and Frank, 3 pk. 6 qt. The boys divided the nuts equally. What quantity did each boy receive?



Problems Without Numbers

How would you find the answer to each of these problems without numbers? Rewrite the problems, putting in reasonable numbers. Exchange with a classmate. Work and prove your classmate's problems.

1. Each week Dave saves some of his allowance. How can he find the average of how much money he saves in a given number of weeks?

2. Virginia paid a certain sum a yard for dress material. How can she find the cost of all the material she bought?

3. How can Bob find how much of his allowance he can spend if he saves a fractional part of it?

4. Bill, Fred, and Max collected many pounds of old newspapers. How can they find the average number of pounds each collected?

5. Mrs. Alden bought a vacuum cleaner and paid a fraction of the price as a first payment. She paid the rest in equal payments. How does she know how much each payment will be?

6. To raise money for the school band, the girls and boys sold salted nuts in packages containing so many ounces. How many pounds of nuts were needed to fill a certain number of bags?

7. Ann knows the price of a part of a pound of dates. How can she find how much several pounds of dates will cost?

Ask the Question

Ask the question that calls for the answer printed after each group of facts. Then work each problem to prove the answer is correct.

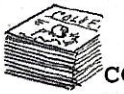
1. A man traveled 45 mi. an hour for 8 hr. (360 mi.)

2. Each of thirty-three school children paid 35¢ for bus fare to the museum. ($11.55)

3. Miss Blane sold 288 cards of buttons in the 5-and-10-cent store. She took in $28.80. ($.10)

4. The Arkansas River is 1450 mi. long. The Rio Grande River is 1800 mi. long. (350 mi.)

5. Last week, we had these temperatures: Monday, 70°; Tuesday, 69°; Wednesday, 72°; Thursday, 75°; Friday, 74°. (72°)



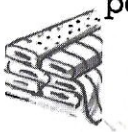
6. The expenses for a party were $3.10 for candy; $1.10 for favors; and $.75 for decorations. Eleven girls shared the cost equally. ($.45)

7. For his store, Mr. Kelly bought 115 yd. of rayon, 95 yd. of cotton, and 215 yd. of muslin. (425 yd.)

8. Bob sold 98 magazines in January; 106, in February; 102, in March; 119, in April; 126, in May; and 121, in June. (112 magazines)

9. Beverly can type 45 words a minute. Today she typed a story 2430 words long. (54 min.)

10. Mr. White owes $3510 on his house. He will pay for it at $65 a month. (54 mo.)



Show that You Know

Add and check.

1. $5.62 + $.09 + $9.40 + $.07 + $.50 + $8.86
2. 3342 + 316 + 4423 + 2790 + 563 + 2698

	a	b	c	d
3.	$ 602.52	$5521.05	$7400.87	$1490.20
	796.79	42.44	823.16	8233.84
	68.36	1918.97	65.88	5692.13
	535.95	75.19	3314.99	4917.72
	136.79	5996.38	37.98	1685.46
	64.48	82.17	644.29	63.79

Subtract and prove.

4.	$1202.95	$1388.38	$1560.76	$1680.46
	623.27	994.83	613.90	710.98
5.	$4702.59	$12037.82	$16419.04	$11841.82
	1249.86	4843.54	9627.95	5387.07

Copy, multiply, and check.

6.	$36.48	$68.04	$ 3.59	$85.70
	58	79	790	283
7.	$81.09	$59.43	$26.91	$16.78
	474	628	630	509

Copy, divide, and prove.

8.	26)10478	56)15400	57)20463	75)$ 429.75
9.	98)44590	115)55315	305)17385	17)$1808.80

A Water Stairway

Can you picture a huge stairway of water leading down, step by step, from the interior of our country to the St. Lawrence River? This greatest of inland waterways is made up of the Great Lakes. On the map, find Lake Superior, the head of the stairway. Now, going east from lake to lake, each of the other lakes drops lower than the one before it.

1. Lake Superior is 603 ft. above sea level; the last step, Lake Ontario, is 246 ft. above sea level. What is the drop in height between these two lakes?

So that boats could pass the waterfalls made by the lakes dropping from one level to another, canals with locks had to be built by Canada and America.

2. By looking at the map, tell the name of the canals connecting Lake Superior and Lake Huron.

3. What boat passage is there on the Canadian side of Niagara Falls?

4. Using the scale of miles on the map, find the approximate length of the New York State Barge Canal to the point it reaches the Hudson River.

5. By water, how many miles is it from Duluth, Minnesota, to Chicago, Illinois? From Toledo, Ohio, to Buffalo, New York? From Buffalo, New York, to Albany, New York?

6. How many miles is it across the widest part of each of the lakes?

Recalling Fractions

A number like 5 is a **whole number.**

A number like $\frac{1}{3}$, $\frac{3}{4}$, or $\frac{7}{8}$ is a **fraction.**

We use a fraction:

1. To show one or more of the equal parts into which a single thing has been divided, as $\frac{1}{8}$ or $\frac{5}{8}$ of a circle.

2. To show one or more of the equal parts of a group of things, as $\frac{1}{4}$ or $\frac{3}{4}$ of 12 pencils.

3. To show division. The fraction $\frac{17}{6}$ means $17 \div 6$.

4. To show the relation or **ratio** of one number to another. When you say $\frac{3}{5}$ of the rooms in your house are bedrooms, you mean that 3 of the 5 rooms are bedrooms. The ratio of 3 to $5 = \frac{3}{5}$.

The **denominator** of a fraction (the number below the line) shows into how many equal parts the whole has been divided. The **numerator** (the number above the line) shows how many of the equal parts have been taken. The numerator and denominator are the **terms** of the fraction.

Fractions in which the numerator is smaller than the denominator are **proper fractions:** $\frac{1}{2}$, $\frac{2}{3}$, $\frac{3}{4}$.

Fractions in which the numerator is as large as or larger than the denominator are **improper fractions:** $\frac{6}{6}$, $\frac{9}{4}$, $\frac{5}{3}$.

A whole number and a fraction written together make a **mixed number:** $3\frac{1}{2}$, $5\frac{2}{3}$, $6\frac{4}{5}$.

More practice on page 365.

Recalling Fractions

1. Name each of these: $\frac{3}{8}$, $3\frac{1}{3}$, $\frac{4}{4}$, $\frac{9}{8}$.

To change a fraction to **higher** terms, multiply both terms of the fraction by the same number.

2. Give the missing numbers: $\frac{3}{8} = \frac{?}{16}$, $\frac{5}{6} = \frac{?}{24}$, $\frac{1}{3} = \frac{1}{?}$.

To reduce a fraction to **lower** terms, divide both terms of the fraction by the same number. To reduce a fraction to **lowest** terms, divide both terms of the fraction by the largest number which will exactly divide both terms.

3. Reduce to lowest terms: $\frac{60}{72}$, $\frac{27}{36}$, $\frac{24}{40}$, $\frac{84}{100}$.

To change an improper fraction to a whole or a mixed number, divide the numerator by the denominator. If there is a fraction in the answer, reduce it to lowest terms.

4. Change to whole or mixed numbers: $\frac{27}{9}$, $\frac{31}{7}$, $\frac{4}{2}$, $\frac{19}{5}$.

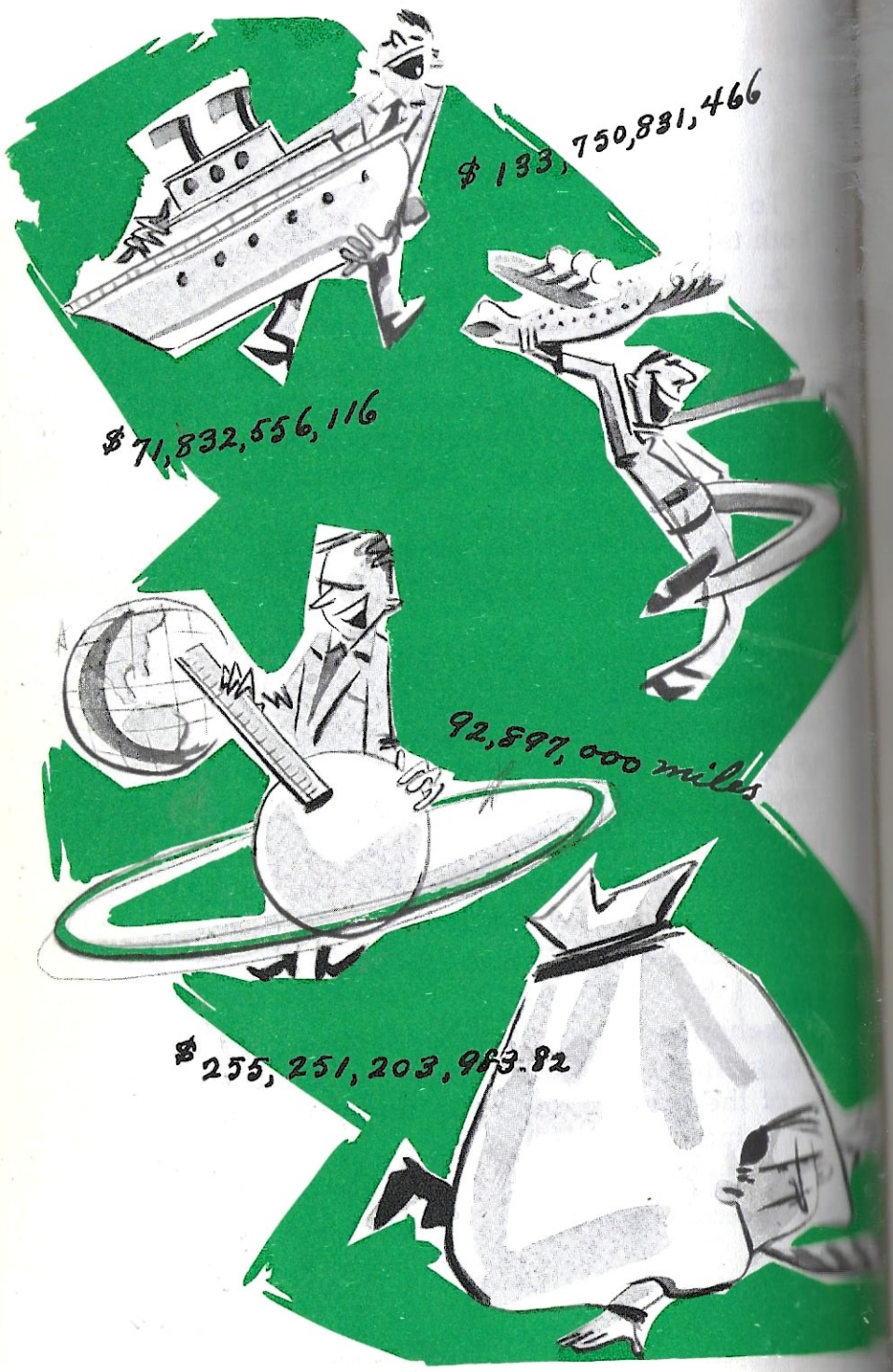
To change a mixed number to an improper fraction, multiply the whole number by the denominator of the fraction and add the numerator. Write the result over the denominator.

5. Change to improper fractions: $3\frac{7}{8}$, $5\frac{1}{12}$, $10\frac{5}{9}$, $19\frac{7}{10}$.

To change a whole number to an improper fraction, multiply the whole number by the denominator of the fraction and write the product over the denominator.

6. $8 = \frac{?}{3}$ $\quad 5 = \frac{?}{4}$ $\quad 7 = \frac{?}{5}$

More practice on page 366.



A Newspaper Office

Busy, busy, busy is a newspaper office. Into it all day and all night rushes news to be printed.

If only our eyes could see the news dashing in!

Look. See Imports. What does he say? "71,832,556,116 dollars worth of goods came into our country in one year."

There goes Exports. Quick, find out what went out of our land in that year. "133,750,831,466 dollars worth of goods!"

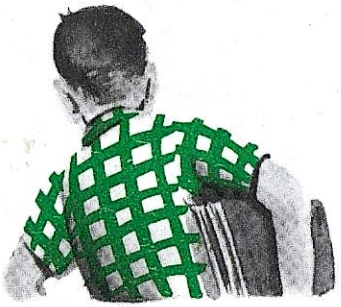
Look at Science. Listen. He is telling us that the average distance between our earth and the sun is 92,897,000 miles.

Oh, dear! There comes a poor American staggering under the National Debt of 1952. How much is it? $255,251,203,983.82!

The busy newspaper's editors will round these numbers to the nearest million or the nearest billion. Do each one for him both to millions and to billions, so he may take his choice.

Bring to school tomorrow some huge number from tonight's paper and tell the class about it.

$ 255,251,203



Working with Fractions

Fractions with the same denominators are called **like** fractions. The denominator of like fractions is their **common denominator.**

To add like fractions, add the numerators and write their sums over the common denominator.

1. Add: $\frac{1}{8}+\frac{3}{8}+\frac{5}{8}$; $\frac{3}{10}+\frac{1}{10}+\frac{9}{10}$.

To subtract like fractions, subtract the smaller numerator from the larger one, and write the difference over the common denominator. Reduce to lowest terms.

2. Subtract: $\frac{7}{8}-\frac{5}{8}$; $\frac{15}{16}-\frac{3}{16}$; $\frac{5}{12}-\frac{4}{12}$.

Study each example and explain the steps used in working it.

$2\frac{2}{5}$	$7\frac{5}{6}$	$8\frac{1}{3}=7\frac{4}{3}$	$9\ =8\frac{5}{5}$
$+1\frac{3}{5}$	$-4\frac{2}{6}$	$-4\frac{2}{3}=4\frac{2}{3}$	$-2\frac{4}{5}=2\frac{4}{5}$
$3\frac{5}{5}=4$	$3\frac{3}{6}=3\frac{1}{2}$	$3\frac{2}{3}$	$6\frac{1}{5}$

To make sure you understand, work these examples. Beside your work, write exactly what you did to find your answer.

Add.

	a	b	c
3.	$\frac{3}{7}+\frac{3}{7}+\frac{1}{7}$	$\frac{2}{9}+\frac{4}{9}+\frac{5}{9}$	$\frac{5}{6}+\frac{1}{6}+\frac{3}{6}$
4.	$8\frac{1}{5}+1\frac{2}{5}+2\frac{2}{5}$	$3\frac{1}{3}+4\frac{1}{3}+2\frac{1}{3}$	$1\frac{3}{8}+4\frac{1}{8}+5\frac{3}{8}$

Subtract.

5.	$8\frac{3}{5}-4\frac{2}{5}$	$6\frac{3}{8}-3\frac{5}{8}$	$9\frac{2}{5}-2\frac{4}{5}$
6.	$7\ -3\frac{1}{3}$	$8\ -4\frac{5}{6}$	$7\ -\frac{7}{8}$

Working with Unlike Fractions

To add or subtract **unlike** fractions make them into like fractions having the **least common** denominator. Then add or subtract.

Study the examples in the box.

In example **a**, one of the denominators is the least common denominator.

In **b**, one denominator times the other gives the least common denominator.

In **c**, the least common denominator is found by multiplying the largest denominator by 2.

Sometimes, as in **d**, 2 times the largest denominator cannot be divided by the other denominators. In that case, multiply the largest denominator by 3, or, if necessary, by 4 to find the common denominator.

a	b	c	d
$\frac{1}{3}=\frac{1}{3}$	$\frac{1}{2}=\frac{5}{10}$	$\frac{5}{8}=\frac{15}{24}$	$\frac{1}{2}=\frac{6}{12}$
$+\frac{2}{3}=\frac{2}{3}$	$+\frac{2}{5}=\frac{4}{10}$	$+\frac{5}{12}=\frac{10}{24}$	$\frac{2}{3}=\frac{8}{12}$
$1=1\frac{1}{3}$	$\frac{9}{10}$	$\frac{25}{24}=1\frac{1}{24}$	$+\frac{1}{4}=\frac{3}{12}$
			$\frac{17}{12}=1\frac{5}{12}$

To show you understand, work these examples. After each, explain exactly what you did.

Add.

	a	b	c	d
1.	$\frac{3}{8}+\frac{5}{8}$	$\frac{2}{3}+\frac{1}{4}$	$\frac{2}{9}+\frac{1}{6}$	$\frac{1}{2}+\frac{7}{8}+\frac{2}{3}$

Subtract.

2.	$\frac{3}{8}-\frac{1}{4}$	$\frac{3}{5}-\frac{1}{2}$	$\frac{5}{6}-\frac{5}{9}$	$\frac{5}{12}-\frac{3}{8}$

Show that You Know

1. Write 3 like fractions and add them.

2. Write 2 like fractions and subtract the smaller from the larger.

3. Write an improper fraction and change it to a mixed number.

4. Write a mixed number and change it to an improper fraction.

5. Write the number 7 as 4ths.

Add.

	a	b	c	d	e
6.	$\frac{2}{3}$ $\frac{1}{2}$ $\frac{5}{6}$	$\frac{3}{4}$ $\frac{1}{3}$ $\frac{7}{12}$	$\frac{3}{5}$ $\frac{2}{3}$ $\frac{1}{2}$	$\frac{4}{5}$ $\frac{3}{4}$ $\frac{3}{10}$	$\frac{1}{2}$ $\frac{3}{4}$ $\frac{1}{6}$
7.	$3\frac{1}{2}$ $7\frac{1}{4}$ $4\frac{7}{12}$	$10\frac{5}{6}$ $2\frac{1}{4}$ $5\frac{7}{8}$	$9\frac{3}{4}$ $14\frac{2}{3}$ $7\frac{5}{6}$	$5\frac{2}{3}$ $6\frac{7}{8}$ $7\frac{5}{12}$	$3\frac{1}{4}$ $5\frac{2}{3}$ $6\frac{3}{8}$

Subtract.

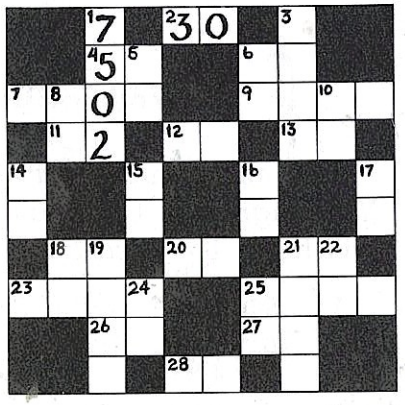
8.	$\frac{15}{16}$ $\frac{3}{16}$	$\frac{9}{10}$ $\frac{3}{5}$	$\frac{3}{4}$ $\frac{2}{3}$	$\frac{5}{6}$ $\frac{3}{4}$	$\frac{7}{8}$ $\frac{1}{6}$
9.	$16\frac{3}{4}$ $5\frac{7}{8}$	$10\frac{1}{2}$ $9\frac{2}{3}$	$21\frac{5}{8}$ $13\frac{5}{6}$	$15\frac{11}{12}$ $9\frac{4}{9}$	$16\frac{1}{10}$ $5\frac{3}{4}$

10. If you subtract a certain mixed number from $12\frac{5}{6}$, the remainder will be $3\frac{3}{6}$. What is the number subtracted?

11. From the sum of $7\frac{7}{8}$ and $3\frac{3}{4}$, subtract the sum of $2\frac{1}{5}$ and $4\frac{1}{2}$.

More practice on page 366.

Copy the form twice elsewhere. Work the puzzle by writing in the answers to the examples given below. Write only one figure in a square. Two answers are given to guide you.



Cross Number Puzzle

Across

3. 270 ÷ 9 =
4. 208 ÷ 4 =
6. $\frac{1}{4}$ of 40 =
7. MMCV =
9. 25 × 90 + 300 =
11. 5984 − 5962 =
12. 18 × 5 =
13. $18\frac{3}{4} + 5\frac{11}{12}$ =
18. 1 yr. = ? wk.
20. $58\frac{5}{7} - 48\frac{2}{7}$ =
21. 12 hr. 15 min. + 9 hr. 45 min. = ? hr.
22. 94 × 94 =
23. 342 × 2 ÷ 4 + 954 =
26. three 30's =
27. $\frac{1}{8} + 13\frac{5}{8} + 12\frac{2}{8}$ =
28. 3 ft. = ? in.

Down

1. 341 × 22 =
3. 33664 ÷ 32 =
5. $24\frac{1}{3} + \frac{2}{3}$ =
6. LII =
8. 58 + 15 − 61 =
10. 45989 − 45935 =
14. XXXIV − XIX (Answer in Roman numerals)
15. 25 × 25 ÷ 5 − 100 =
16. $14\frac{3}{7} - 3\frac{3}{7}$ =
17. 1 bu. = ? qt.
18. 2754 ÷ 54 =
19. 954 + 127 + 917 + 999 =
21. 45 × 507 − 18917 ÷ 2 + 214 =
22. 16 gal. 3 qt. + 5 gal. 1 qt. = ? gal.
24. 1 min. = ? sec.
25. 1 doz. =

Ways of Using Fractions

You might know that 6 books will fill $\frac{1}{5}$ of a box. You might want to know how many books the box will hold. $6 = \frac{1}{5}$; so $\frac{5}{5}$ will be 5×6 books $= 30$ books.

1. 5 is $\frac{1}{4}$ of ? 6 is $\frac{1}{7}$ of ? 9 is $\frac{1}{9}$ of ?

2. 7 is $\frac{1}{8}$ of ? 4 is $\frac{1}{12}$ of ? 9 is $\frac{1}{10}$ of ?

You might know that \$15 is $\frac{3}{5}$ of what you need to buy a radio. If \$15 is $\frac{3}{5}$, $\frac{1}{5}$ would be $\$15 \div 3 = \$5$. If \$5 is $\frac{1}{5}$, $\frac{5}{5}$ would be $5 \times \$5$ or \$25.

3. 20 is $\frac{4}{5}$ of ? 24 is $\frac{3}{7}$ of ? 49 is $\frac{7}{10}$ of ?

4. 35 is $\frac{5}{7}$ of ? 45 is $\frac{3}{4}$ of ? 56 is $\frac{7}{9}$ of ?

Suppose 12 pencils cost 96¢ and you want to buy 9. One pencil will cost $\frac{1}{12}$ of $96¢ = 8¢$. Nine pencils will cost $9 \times 8¢ = 72¢$.

Find the cost of:

5. 5 tarts at 72¢ a doz.; 12 oz. of lobster at \$1.28 a lb.

6. 3 pk. of tomatoes at \$1.00 a bu.; 15 qt. of peas at \$1.92 a bu.

You slept 8 out of 24 hours and want to know what part of the 24-hour day you had slept. Write the numbers as $\frac{8}{24}$ and reduce them to lowest terms. $\frac{8}{24} = \frac{1}{3}$. You had slept $\frac{1}{3}$ of the 24-hour day.

7. 5 is what part of 50? 16 is what part of 64?

8. 5 in. are what part of 1 ft.? 10 min. are what part of 1 hr.?

More practice on page 367.

Keeping Up the Review

Change.

	a	b
1.	5 T. 6 cwt. to pounds	6400 oz. to pounds
2.	8 bu. 3 pk. to quarts	720 pt. to gallons
3.	5 yd. 2 ft. to inches	672 pt. to bushels
4.	7 gal. 1 qt. to pints	63,360 in. to yards

Add.

	a	b	c
5.	3 lb. 9 oz.	3 bu. 1 pk.	7 wk. 6 da.
	4 lb. 10 oz.	19 bu. 2 pk.	5 wk. 5 da.
		7 bu. 3 pk.	4 da.

Subtract.

6.	8 wk. 4 da.	7 gro. 2 doz.	4 mi. 732 ft.
	5 wk. 6 da.	2 gro. 9 doz.	1 mi. 4980 ft.

Multiply.

7.	7 T. 256 lb.	9 hr. 10 min.	10 bu. 3 pk.
	3	6	26
8.	11 gal. 2 qt.	16 yd. 2 ft.	4 min. 30 sec.
	3	6	11

Divide.

9.	6)18 T. 144 lb.	8)12 ft. 8 in.	7)8 gal. 3 qt.
10.	9)20 bu. 1 pk.	7)59 min. 9 sec.	2)17 yd. 1 ft.

11. Add 1 ft. 10 in. and 2 ft. 8 in., and subtract the sum from 5 yd. $2\frac{1}{4}$ ft. Multiply the remainder by 3, and divide the product by 6.

Fun with Pictographs

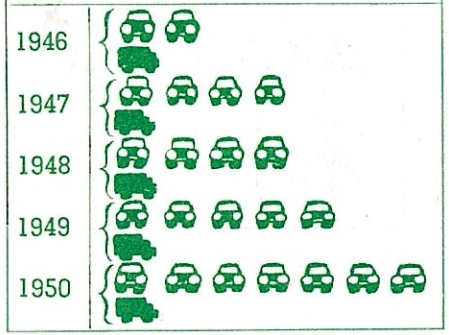
A picture graph, or **pictograph,** is fun to make, as well as being useful. Pictographs, just as bar or line graphs, can be used to compare figures in reports.

Here is a report about United States automobile and truck production.

Year	Automobiles	Trucks
1946	2,148,699	990,851
1947	3,588,178	1,239,744
1948	3,909,270	1,376,155
1949	5,119,466	1,134,136
1950	6,665,628	1,337,154

Now here is a pictograph that shows this report. The figures have been rounded to the nearest million for easy use. Each picture, or symbol, stands for one million.

U. S. Automobile and Truck Production



1. In what year were the most automobiles produced?

2. How many trucks were produced altogether in the years shown? How many automobiles? Find the difference between the two totals.

3. Appoint a committee to find how many boys and how many girls are in each class in your school. Make a pictograph to show this record.

More practice on page 368.

Multiplying Fractions

Do you remember how to multiply fractions?

In multiplying fractions, multiply the numerators together for a new numerator, and the denominators together for a new denominator.

Do you remember about canceling when you are working with fractions?

Canceling means to divide a numerator and a denominator by the same number.

Study each example and explain every step in working it. Remember that you cannot always cancel.

$\frac{7}{24}\times\frac{8}{21}=?$	$\frac{9}{20}\times\frac{2}{3}=?$	$\frac{3}{4}\times\frac{8}{15}\times\frac{1}{2}=?$
$\frac{\cancel{7}^{1}}{\cancel{24}_{3}}\times\frac{\cancel{8}^{1}}{\cancel{21}_{3}}=\frac{1}{9}$	$\frac{\cancel{9}^{3}}{\cancel{20}_{10}}\times\frac{\cancel{2}^{1}}{\cancel{3}_{1}}=\frac{3}{10}$	$\frac{1}{\cancel{4}_{1}}\times\frac{\cancel{8}^{\cancel{2}^{1}}}{\cancel{15}_{5}}\times\frac{\cancel{1}}{\cancel{2}_{1}}=\frac{1}{5}$

Multiply.

	a	b	c	d
1.	$\frac{3}{5}\times\frac{5}{8}$	$\frac{5}{6}\times\frac{1}{5}$	$\frac{1}{2}\times\frac{4}{5}$	$\frac{7}{9}\times\frac{9}{16}\times\frac{1}{7}$
2.	$\frac{2}{4}\times\frac{5}{8}$	$\frac{3}{16}\times\frac{4}{9}$	$\frac{5}{9}\times\frac{3}{10}$	$\frac{7}{8}\times\frac{3}{4}\times\frac{1}{7}$
3.	$\frac{4}{5}\times\frac{5}{6}$	$\frac{2}{3}\times\frac{9}{16}$	$\frac{1}{2}\times\frac{8}{15}$	$\frac{3}{10}\times\frac{5}{12}\times\frac{1}{3}$
4.	$\frac{1}{5}\times\frac{2}{3}$	$\frac{4}{5}\times\frac{2}{3}$	$\frac{1}{6}\times\frac{3}{4}$	$\frac{5}{6}\times\frac{1}{2}\times\frac{2}{3}$
5.	$\frac{4}{7}\times\frac{5}{7}$	$\frac{5}{7}\times\frac{5}{9}$	$\frac{3}{4}\times\frac{5}{12}$	$\frac{5}{9}\times\frac{2}{3}\times\frac{1}{5}$

Now study each of these examples. Tell what you are multiplying by what, and explain in order the steps taken. The fraction $\frac{40}{1}$ really equals the whole number 40. So from here on, let's have the denominator 1 understood and not written under whole numbers.

$\frac{4}{5}\times 10=?$	$9\times\frac{5}{6}=?$	$5\times 3\frac{3}{5}=?$
$\frac{\cancel{4}^{2}}{\cancel{5}_{1}}\times\frac{\cancel{10}^{2}}{1}=\frac{8}{1}=8$	$\frac{\cancel{9}^{3}}{1}\times\frac{5}{\cancel{6}_{2}}=\frac{15}{2}=7\frac{1}{2}$	$\frac{1}{\cancel{5}_{1}}\times\frac{\cancel{18}^{3}}{\cancel{5}_{1}}=18$

Multiply.

	a	b	c	d
1.	$\frac{4}{5}\times 10$	$\frac{3}{7}\times 11$	$\frac{3}{10}\times 12$	$7\times\frac{2}{3}$
2.	$9\times 4\frac{4}{9}$	$8\times 5\frac{1}{4}$	$9\times 8\frac{2}{9}$	$6\times 3\frac{5}{12}$
3.	$\frac{3}{10}\times 10$	$15\times\frac{7}{12}$	$4\times 6\frac{3}{10}$	$9\times 3\frac{5}{6}$

Study these examples and explain each as you did those in the first box.

$5\frac{1}{4}\times\frac{4}{7}=?$	$2\frac{2}{3}\times 2\frac{5}{8}=?$	$3\frac{3}{8}\times 1\frac{7}{9}=?$
$\frac{\cancel{21}^{3}}{\cancel{4}_{1}}\times\frac{\cancel{4}^{1}}{\cancel{7}_{1}}=3$	$\frac{\cancel{8}^{1}}{\cancel{3}_{1}}\times\frac{\cancel{21}^{7}}{\cancel{8}_{1}}=7$	$\frac{\cancel{27}^{3}}{\cancel{8}_{1}}\times\frac{\cancel{16}^{2}}{\cancel{9}_{1}}=6$

Multiply.

1.	$3\frac{1}{4}\times 4\frac{4}{5}$	$4\frac{2}{3}\times 3\frac{3}{7}$	$8\frac{1}{7}\times 6\frac{2}{9}$	$5\frac{1}{2}\times\frac{7}{8}$
2.	$4\frac{4}{5}\times 5\frac{5}{12}$	$8\frac{1}{8}\times 3\frac{1}{5}$	$7\frac{2}{5}\times 1\frac{5}{9}$	$9\frac{7}{10}\times\frac{5}{6}$

More practice on page 369.

Thrifty Shopping

Thrifty shoppers buy in quantity the groceries that will keep for some time without spoiling. Mrs. Smith, for example, knows that flour keeps well. She also knows that it costs more to buy 1 pound of flour at a time than 10 pounds. Why do you think she should buy 1 dozen eggs rather than 10 dozen?

A supermarket sold some of its groceries at the following prices:

Sugar	1 lb.	12¢	10 lb.	99¢
Biscuit Mix	20 oz.	27¢	40 oz.	50¢
Canned Peas	8 oz.	12¢	16 oz.	19¢
Canned Tomatoes	1 can	27¢	2 cans	51¢
Milk	1 pt.	14¢	1 qt.	24¢
Soap Powder	19 oz.	29¢	38 oz.	51¢
Fruit Juice	1 can	14¢	2 cans	25¢

1. What is the total you could save by buying all the groceries in the list in the quantity shown at the right of the list?

2. Mrs. Dale bought a 20-oz. package of biscuit mix, 1 pt. of milk, a 19-oz. package of soap powder, and a can of fruit juice. What was her grocery bill?

3. Mrs. Ray bought the same groceries as Mrs. Dale, only Mrs. Ray bought in the quantity shown at the right of the list. Find the difference between her bill and Mrs. Dale's.

4. Mr. Winters bought two 16-oz. cans of peas, two quarts of milk, and two 38-oz. packages of soap powder. How much money did he save?

5. On your next shopping trip, make a list of groceries you can buy in quantity to save money.

Mixed Numbers Times Large Numbers

An airplane flew $6\frac{1}{3}$ hr. at the rate of 293 miles an hour. How far did it fly?

You have two ways of working such a problem. The choice is yours.

1.	2.	
	293	
$293 \times 6\frac{1}{3} = \frac{5567}{3}$	$6\frac{1}{3}$	$293 \times \frac{1}{3} = 97\frac{2}{3}$
	$97\frac{2}{3}$	
$\frac{5567}{3} = 1855\frac{2}{3}$ mi.	1758	
	$1855\frac{2}{3}$ mi.	

Remember: To multiply a large whole number by a mixed number, multiply by the fraction and then by the whole number in the multiplier. Add the partial products.

Multiply the way you like better.

	a	b	c	d
1.	120	156	124	225
	$5\frac{1}{4}$	$2\frac{3}{4}$	$7\frac{3}{8}$	$6\frac{4}{5}$

2. A grove owner shipped 72 doz. oranges to a dealer. He was paid $27\frac{1}{2}¢$ a dozen. How much did he receive?

3. A plane took off with 180 gallons of gasoline. It used 36 gallons per hour at cruising speed. How many gallons were left after flying $2\frac{1}{4}$ hours at that speed?

More practice on page 369.

Making Sure

Add.

	b	c	d	e
	$5\frac{1}{6}$	$5\frac{3}{8}$	$4\frac{3}{10}$	$3\frac{1}{4}$
	$7\frac{2}{3}$	$6\frac{1}{3}$	$8\frac{2}{5}$	$9\frac{1}{6}$
	$7\frac{4}{6}$	$7\frac{5}{6}$	$6\frac{3}{4}$	$2\frac{7}{8}$

Subtract.

	$9\frac{5}{6}$	$7\frac{1}{2}$	$8\frac{2}{5}$	$9\frac{5}{6}$
	$7\frac{1}{3}$	$4\frac{5}{9}$	$7\frac{1}{2}$	$4\frac{3}{8}$

Multiply.

	$\frac{2}{5} \times \frac{6}{7}$	$\frac{3}{5} \times \frac{1}{4}$	$\frac{3}{5} \times \frac{5}{9} \times \frac{3}{4}$
	$\frac{7}{8} \times \frac{3}{8}$	$\frac{4}{9} \times \frac{3}{16}$	$\frac{7}{10} \times \frac{2}{3}$
	$\frac{5}{7} \times 21$	$6 \times \frac{2}{3}$	$8 \times \frac{5}{6} \times \frac{1}{2}$
	$8\frac{2}{3} \times 6$	$9\frac{2}{7} \times 3$	$7\frac{1}{6} \times 9$
	$25 \times 3\frac{1}{10}$	$24 \times 7\frac{5}{6}$	$18 \times 5\frac{5}{9}$
	$4\frac{3}{8} \times 2\frac{2}{7}$	$6\frac{7}{8} \times 4\frac{4}{5}$	$3\frac{3}{7} \times 5\frac{1}{4}$
	$5\frac{4}{5} \times 215$	$9\frac{1}{4} \times 376$	$10\frac{1}{6} \times 726$

25 is $\frac{1}{4}$ of ? 25 is $\frac{5}{8}$ of ? 36 is $\frac{4}{9}$ of ?

Find the cost of 2 doz. erasers at $1.92 a gross.

Dick picked $\frac{5}{8}$ bu. of apples. He sold $\frac{3}{5}$ of them. What part of a bushel did he sell?

We used $3\frac{5}{8}$ yd. of cloth for each of 14 dancers' costumes. How much cloth did we use in all?

The Shape of Things

1. Name the boy who is drawing a square. Tell how you know it is a square.

2. Mary is drawing triangles. Study these angles, and then name the angles in Mary's triangles.

Right Angle Acute Angle Obtuse Angle Straight Angle

3. Define or describe the figure Bill is drawing. What does the line across Bill's drawing do to the drawing?

4. Margaret tried to draw a circle. What is a circle? What is wrong with Margaret's drawing?

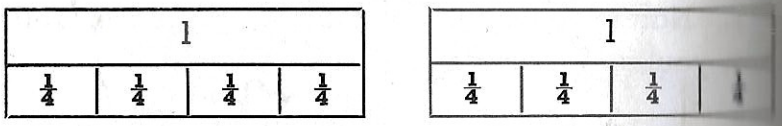
5. An egg-shaped figure is an **oval.** Draw an oval.

6. Here are some letters of the alphabet. Tell how many angles there are in each one. Name the angles.

M H

A E L W

Y



If you divided a whole into fourths would you have 4 times as many fourths as wholes?

Then do these examples make sense?

$1 \div \frac{1}{4} = 1 \times \frac{4}{1} = 4$ fourths. $2 \div \frac{1}{4} = 2 \times \frac{4}{1} = 8$ fourths

Remember: In dividing fractions, invert the divisor, cancel where possible, and multiply.

Study each of these examples and explain the steps in working it.

1. $9 \div \frac{1}{2} = 9 \times \frac{2}{1} = 18$

2. $12 \div 2\frac{1}{4} = 12 \div \frac{9}{4} = \cancel{12}^{4} \times \frac{4}{\cancel{9}_{3}} = \frac{16}{3} = 5\frac{1}{3}$

3. $\frac{5}{6} \div 3 = \frac{5}{6} \div \frac{3}{1} = \frac{5}{6} \times \frac{1}{3} = \frac{5}{18}$

4. $4\frac{2}{3} \div 7 = \frac{14}{3} \div \frac{7}{1} = \cancel{14}^{2} \times \frac{1}{\cancel{7}_{1}} = \frac{2}{3}$

5. $\frac{5}{8} \div \frac{5}{6} = \frac{\cancel{5}^{1}}{\cancel{8}_{4}} \times \frac{\cancel{6}^{3}}{\cancel{5}_{1}} = \frac{3}{4}$

6. $3\frac{3}{8} \div 4\frac{1}{2} = \frac{27}{8} \div \frac{9}{2} = \frac{\cancel{27}^{3}}{\cancel{8}_{4}} \times \frac{\cancel{2}^{1}}{\cancel{9}_{1}} = \frac{3}{4}$

	a	b	c	d
1.	$18 \div \frac{3}{8}$	$9 \div \frac{6}{7}$	$49 \div \frac{7}{8}$	$10 \div \frac{5}{12}$
2.	$5 \div 7\frac{1}{2}$	$56 \div 2\frac{1}{3}$	$36 \div 2\frac{1}{4}$	$120 \div 2\frac{1}{3}$
3.	$\frac{7}{15} \div 28$	$\frac{9}{16} \div 18$	$\frac{3}{5} \div 9$	$\frac{2}{5} \div 8$
4.	$4\frac{1}{2} \div 15$	$16\frac{2}{3} \div 5$	$10\frac{1}{8} \div 9$	$8\frac{4}{7} \div 12$
5.	$\frac{3}{4} \div \frac{7}{15}$	$\frac{9}{10} \div \frac{3}{4}$	$\frac{5}{12} \div \frac{3}{4}$	$\frac{9}{16} \div \frac{3}{8}$
6.	$4\frac{1}{2} \div 12\frac{3}{8}$	$10\frac{1}{2} \div 2\frac{1}{3}$	$8\frac{4}{5} \div 3\frac{3}{10}$	$5\frac{5}{7} \div 2\frac{2}{9}$

Decide whether to multiply or divide each problem, then work the problems.

7. A filling station advertises $6\frac{1}{4}$ gal. of gasoline for $1.25. What is the exact price per gallon?

8. A grocer advertises canned peas at 14¢ a can, or $1.69 a dozen cans. What is the exact saving per can in buying by the dozen? Give your answer in cents and a fraction of a cent.

9. A market advertised $4\frac{1}{2}$ lb. of pork roast for $.54. Find the cost per pound.

10. A druggist advertised soap at $7\frac{3}{4}$¢ a cake. At this rate, how much will he receive for 1 gro. of soap cakes?

11. A department store advertises unbleached muslin at $10\frac{1}{2}$¢ a yard. Find the cost of $12\frac{1}{2}$ yd.

More practice on page 370.

Drawing Circles

1. Cut a strip of cardboard 2 inches long and $\frac{3}{4}$ inch wide. Punch a hole $\frac{1}{8}$ inch at one end. Put a pin through the opposite end, $\frac{1}{8}$ inch from the edge. Lay a sheet of paper on a large cardboard. Now put the cardboard strip on the paper, sticking the pin through the center of the paper and into the cardboard below it. Put your pencil point upright through the hole in your strip. Draw, moving the strip around the pin.

You'll find you have drawn a circle. The distance around the circle is the **circumference.** The center is the point your pin made. It is equal distance from each point in the circumference.

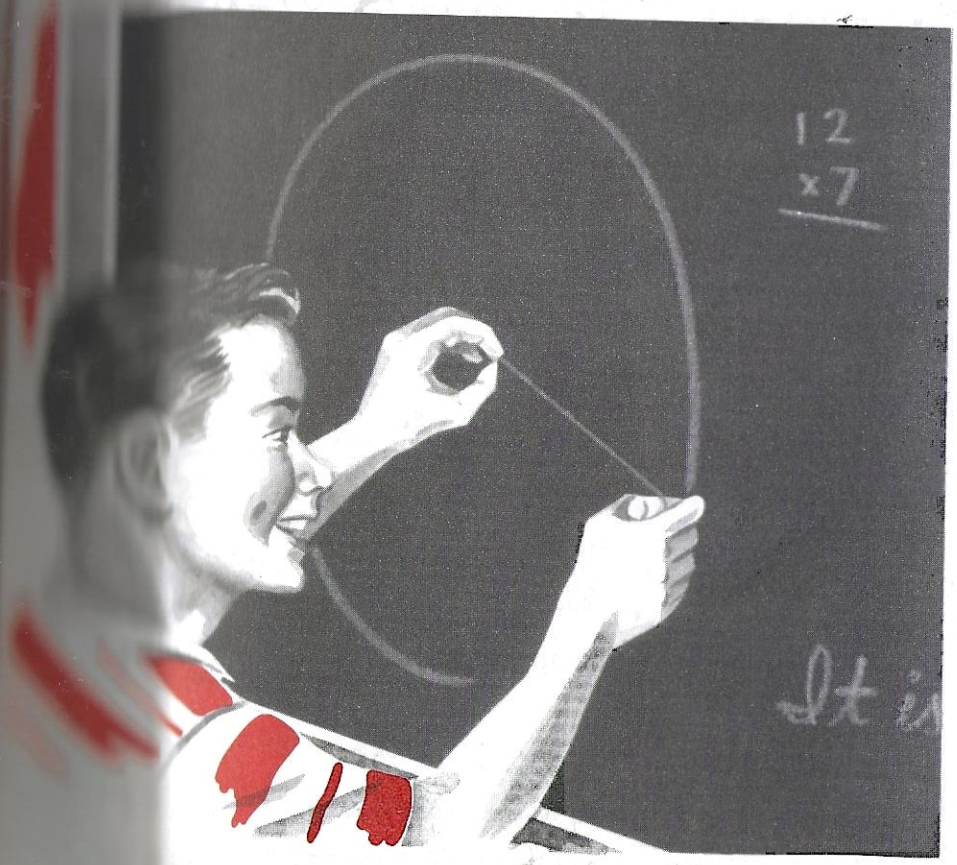
2. With your ruler, draw a straight line from the center to the circumference. This line is the **radius** of the circle.

3. With your ruler, draw a straight line through the center, touching the circumference at both ends. You now have the **diameter** of the circle.

4. Is the radius $\frac{1}{2}$ as long as the diameter? The diameter is ____ as long as the radius.

5. Measure a cardboard strip for a circle with a five-inch radius. Draw it. How long is the diameter of this circle?

6. Could you fit a circle with a five-inch radius on your school paper? Why? Draw it on the blackboard by tying a piece of chalk at one end of a string. Hold the string 5 inches from the chalk in one spot on the blackboard and draw around.



Finding Mistakes

In multiplying fractions, boys and girls sometimes make mistakes like the ones in these examples. Study each example. Be ready to tell what the mistake is in each one and how you would correct it.

	a	b
1.	$2\frac{1}{3} \times \frac{1}{7} = 2\frac{1}{21}$	$3\frac{3}{4} \times 2\frac{1}{3} = \frac{\overset{3}{\cancel{15}}}{\cancel{4}} \times \frac{7}{\cancel{3}_{1}} = \frac{35}{12} = 1\frac{23}{12}$
2.	$6 \times 2\frac{3}{4} = \frac{6}{1} \times \frac{4}{11} = \frac{24}{11} = 2\frac{2}{11}$	$7\frac{4}{5} \times \frac{5}{7} = \frac{\overset{1}{\cancel{39}}}{\cancel{5}} \times \frac{\overset{1}{\cancel{35}}}{\cancel{7}_{1}} = \frac{40}{8} = 5$
3.	$4\frac{1}{6} \times 8 = \frac{25}{6} \times \frac{1}{8} = \frac{25}{48} = 1\frac{17}{48}$	$4\frac{1}{2} \times 3\frac{1}{4} = \frac{\overset{2}{\cancel{9}}}{\cancel{2}_{1}} \times \frac{\overset{6}{\cancel{13}}}{\cancel{4}_{1}} = \frac{78}{1} = 78$
4.	$9 \times 3\frac{3}{5} = \frac{\overset{1}{\cancel{9}}}{\cancel{1}} \times \frac{\overset{2}{\cancel{18}}}{\cancel{5}} = \frac{2}{5}$	$5\frac{1}{7} \times 2\frac{1}{3} = \frac{\overset{1}{\cancel{36}}}{\cancel{7}_{1}} \times \frac{\overset{1}{\cancel{7}}}{\cancel{3}} = \frac{12}{1} = 12$

	a	b	c	d
5.	12 $\times 18\frac{3}{4}$ 96 12 $216\frac{3}{4}$	$48\frac{1}{2}$ $\times 42$ 22 96 192 2038	25 $\times 15\frac{4}{5}$ 20 125 25 3770	$48\frac{3}{8}$ 18 15 384 399

Multiply. Check to see that you have made no mistakes.

	a	b	c	d
6.	$\frac{5}{6} \times 42$	$2\frac{2}{5} \times 4\frac{1}{6}$	$3\frac{3}{10} \times 1\frac{2}{3}$	$1\frac{1}{12} \times \frac{1}{4}$
7.	$6 \times 7\frac{1}{5}$	$3\frac{1}{6} \times 8$	$2 \times 10\frac{1}{2}$	$3\frac{2}{3} \times \frac{7}{11}$

Add.

	a	b	c	d	e
1.	$\frac{5}{8}$ $\frac{1}{8}$ $\frac{1}{4}$	$\frac{7}{8}$ $\frac{5}{8}$ $\frac{3}{4}$	$12\frac{1}{4}$ $4\frac{1}{2}$ $3\frac{7}{8}$	$7\frac{2}{3}$ $9\frac{1}{2}$ $14\frac{5}{6}$	$19\frac{1}{8}$ $8\frac{7}{12}$ $14\frac{1}{3}$

Subtract.

	a	b	c	d	e
2.	$\frac{7}{8}$ $\frac{1}{8}$	16 $7\frac{7}{8}$	$10\frac{3}{8}$ $9\frac{3}{4}$	$26\frac{1}{4}$ $19\frac{5}{9}$	$41\frac{1}{6}$ $34\frac{3}{4}$

Multiply.

	a	b	c	d
3.	$\frac{1}{16} \times 44$	$32 \times \frac{7}{8}$	$\frac{6}{7} \times 84$	$\frac{5}{9} \times 51$
4.	$66 \times 15\frac{3}{4}$	$70 \times 3\frac{2}{5}$	$12\frac{1}{2} \times 36$	$14\frac{2}{3} \times 56$
5.	$1\frac{1}{8} \times 2\frac{2}{3}$	$\frac{6}{7} \times 1\frac{1}{12}$	$\frac{4}{5} \times \frac{7}{10}$	$\frac{3}{8} \times \frac{14}{15} \times \frac{2}{3}$
6.	$87\frac{5}{16} \times \frac{7}{18}$	$\frac{5}{7} \times 21\frac{2}{3}$	$11\frac{1}{5} \times \frac{7}{12}$	$\frac{4}{5} \times 30\frac{5}{8}$
7.	$17\frac{3}{8} \times 31\frac{1}{8}$	$7\frac{7}{8} \times 6\frac{4}{7}$	$9\frac{3}{4} \times 17\frac{5}{6}$	$21\frac{3}{10} \times 14\frac{7}{12}$

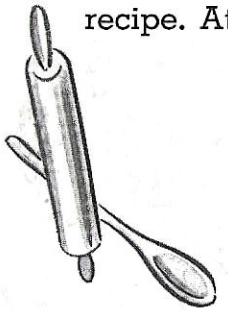
Divide.

	a	b	c	d
8.	$66 \div \frac{7}{18}$	$\frac{5}{6} \div 15$	$14 \div \frac{7}{8}$	$52 \div \frac{2}{3}$
9.	$19\frac{3}{8} \div 62$	$4\frac{1}{5} \div 18$	$25 \div 5\frac{5}{6}$	$24 \div 3\frac{3}{8}$
10.	$1\frac{1}{8} \div \frac{9}{10}$	$\frac{5}{6} \div \frac{5}{24}$	$\frac{9}{16} \div \frac{7}{8}$	$\frac{11}{24} \div \frac{15}{16}$
11.	$15\frac{3}{8} \div 22\frac{1}{12}$	$\frac{4}{5} \div 9\frac{3}{5}$	$4\frac{2}{3} \div \frac{6}{7}$	$17\frac{7}{10} \div 14\frac{2}{5}$

Cooking Just Enough

There were 8 people at Mother's dinner. Ruth made the dessert—apple brown betty.

The recipe was for 4 servings only. So Ruth doubled all the measurements given. All she had to do was to multiply each one by 2. At the left is the recipe. At the right are the measurements Ruth used.



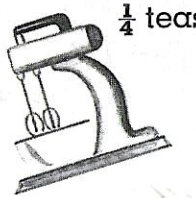
$\frac{1}{3}$ cup sugar	$(\frac{2}{3})$
$\frac{1}{2}$ teaspoon cinnamon	(1)
$\frac{1}{4}$ teaspoon salt	$(\frac{1}{2})$
2 cups fine, dry crumbs	(4)
4 apples, pared and diced	(8)
3 tablespoons melted butter	(6)

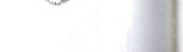
1. Show how Ruth worked out her measurements for doubling the recipe.

Ruth **increased,** or made larger, the recipe for apple brown betty by multiplying. If you wished to **decrease,** or make smaller, a recipe, you would divide each measurement.

2. By dividing by 2, decrease this recipe for baked custard. Your measurements should make enough baked custard for two servings instead of the four servings given in the recipe.

$\frac{1}{4}$ cup sugar	4 eggs, beaten
$\frac{1}{4}$ teaspoon salt	2 cups hot milk
1 teaspoon vanilla	





Making Problems

One of the fine things about making something ourselves is that we can understand better a similar thing made by someone else. This is true in making problems, too.

Make a problem out of each paragraph. Then, work and check your problems.

1. Mr. Jackson put rubber tiles on his hall floor. There were 12 tiles in each row and there were 15 rows.

2. In a recent year, Africa had 1331 theaters; Asia had 6794. The United States had 19,796.

3. Mr. Andrews buys a home for $12,000. He pays $2000 down. The rest will be paid at $100 a month.

4. Joan's arithmetic marks for five days were 98, 100, 94, 95, and 100.

5. The Community House Players gave a play. They sold 135 tickets to children for 20¢ and 75 tickets to adults for 35¢.

6. Mary's family bought a television set for $199.98. They paid $\frac{1}{2}$ the price down. Each of three family members will pay an equal amount of the rest of the cost.

About Divisors

If you learn and use what this table tells you your work in division and in changing fractions to lowest terms will be easier.

2 will exactly divide any even number.
5 will exactly divide any number that ends in 5 or 0.
10 will exactly divide any number that ends in 0.
3 will exactly divide a number if the sum of its figures can be exactly divided by 3. The sum of the figures in the number 723 is 12. 7+2+3=12. 12÷3=4. 723÷3=241.
6 will exactly divide any even number that 3 will exactly divide.
4 will exactly divide a number if the last two figures of the number are exactly divisible by 4. In the number 2564, 64÷4=16. 2564÷4=641.
8 will exactly divide a number if the last three figures are exactly divisible by 8.
9 will exactly divide a number if the sum of its figures can be exactly divided by 9.

1. Tell which of the following numbers are exactly divisible by 2, 3, 4, 5, 6, 8, 9, 10.

32 75 84 378 440 500 672 2764

2. In each of these fractions, tell whether both terms are exactly divisible by 2, 3, 4, 5, 6, 8, 9, 10. Then reduce the fractions to lowest terms.

$\frac{12}{16}$ $\frac{24}{42}$ $\frac{18}{36}$ $\frac{25}{40}$ $\frac{30}{60}$ $\frac{54}{135}$ $\frac{150}{175}$

Making Sure

Add and check.

	a	b	c	d	e
1.	8989	86876	80610	4893	$424.57
	685	26478	9669	50691	77.67
	9997	472	64985	8574	74.57
	957	834	28322	12896	714.43
	6049	95455	4173	3331	84.62
	766	978	55780	9519	112.98
	6879	1439	5686	33219	52.59

Subtract and prove.

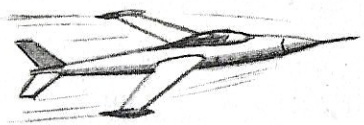
2.	17674	12302	64375	80018	$913.77
	9023	4849	15968	52581	621.93
3.	95436	60206	82821	95019	$700.52
	81745	47937	75035	49178	309.53

Multiply and check.

4.	9158	6038	5812	9460	$60.75
	157	384	509	275	458
5.	4199	8035	7349	6297	$97.24
	748	690	802	906	369

Divide and prove.

	a	b	c	d
6.	72)60120	39)38152	64)44000	87)$752.84
7.	461)35497	225)19620	846)40608	438)$717.42



America's Gift of Education

[illegible] watch you saw in the window and wanted [illegible] for a gift is priced at $27.75. It's worth no [illegible] and no less. True, it is handsome, and it does [illegible] beautifully. It's a fine gift.

[illegible] is even a finer gift, however. America [illegible] it to each of her citizens. Unlike the watch, [illegible] be stolen, it cannot be destroyed, and [illegible] more than look handsome and tell time. [illegible] guessed that this priceless gift is your [illegible]

[illegible] your watch after a few years, you'd [illegible] receive what it cost. Watches wear out. [illegible] you "sell" your education by working at the [illegible] profession for which you were educated, [illegible] you receive depends on how well you used [illegible] school days.

1. As an educated citizen, what benefits can [illegible] give to others and receive for yourself?

2. In 1880, there were 15,065,767 boys and girls [illegible] public school. In a recent year, the [illegible] was 24,476,658. What was the increase [illegible] these years? Round your answer to the [illegible] thousand.

3. A recent count of schools shows that we have [illegible] elementary schools; 25,484 secondary [illegible] 14,363 private schools; 1788 universities and [illegible] schools, both public and private; [illegible] nursing schools; and 544 schools for excep- [illegible] children. Find the total number of schools in [illegible] America.

Cash Received				Cash Spent			
Nov. 1	Allowance	2 75		Nov. 3	Haircut	1 00	
8	Cleaning yard	50		7	Church	20	
16	Errands	45		10	Socks	69	
20	Working in Uncle's shop	1 00		14	Church	20	
29	Errands	30		18	Movies	45	
				21	Church	20	
				22	Sodas	50	
				27	Fix sled	90	
				28	Church	20	
				29	Movies	45	
		5 00				4 79	
Dec. 1	Cash on hand	21		Nov. 30	Cash on hand	21	
						5 00	

Bill's Cash Account

The Murrays are an average family, not rich, not poor. Let's see arithmetic in action in that family.

Consider Bill Murray. Bill's monthly allowance is $2.75. He keeps a **cash account** to tell him how much money he has and what happens to it. This is Bill's cash account for November.

1. What information appears on the left side of the cash account? On the right side?

2. Does the cash on hand equal the difference between the amount spent and the amount received?

3. Check Bill's account by finding the cash on hand and then totaling each side.

4. Keep a cash account for a month.

	What Happened	Rec'd.	Paid
Dec. 1	Cash on hand	95 50	
	Salary	350 00	
	Payment on house		85 00
	Insurance		9 50
	Bill's Allowance		2 75
5	Church		1 00
6	Grocery bill		65 00
	Telephone, gas, electricity		11 62
	Shirt		5 98
12	Church		1 50
13	Mother's own money		25 00
15	Savings bank		100 00
17	Christmas charity		30 00
19	Church		1 75
21	Christmas Shopping		50 00
22	Bill's jacket		12 89
26	Church		2 00
30	Movies for the family		2 25
31	Balance		39 26
		445 50	445 50
Jan. 1	Cash on hand	39 26	

The Family Account

Mr. Murray keeps a monthly account, too.

1. Check Mr. Murray's "Received" and "Paid" columns. Are the answers correct?

2. What was the "Balance" called in Bill's account? How did Mr. Murray get the balance?

3. Which of the items will be about the same in January? What new items might be included?

4. Turn Mr. Murray's account into one like Bill's.

Keeping Accounts

Make two blank copies of Bill's and Mr. Murray's accounts forms. Then, make and balance the following accounts:

1. Received: Sept. 1—Cash on hand, 49¢; Allowance, $1.25; Sept. 4—Washing car, 75¢; Sept. 9—Baby-sitting, 80¢; Sept. 16—Cleaning yard, 45¢; Sept. 21—Cleaning attic, 85¢; Sept. 29—Errand, 15¢. Paid: Sept. 3—Theater, $1.25; Sept. 6—Socks, 79¢; Sept. 22—Cap, 80¢; Sept. 30—Club dues, 50¢.

2. Cash received: May 1—Cash on hand, $2.13; Allowance, 75¢; May 10—Errand, 15¢; May 12—Selling old newspapers, 35¢; May 22—Baby-sitting, 85¢; May 27—Typing, 98¢; May 30—Selling flowers, $1.50. Cash spent: May 2—Skirt material, $2.00; May 11—Chocolate bar, 5¢; May 18—Book, 50¢; May 28—Savings bank, $1.90.

3. Cash Received: Feb. 1—Cash on hand, $58.00; Salary, $200. Cash spent: Feb. 1—Rent, $60.00; Feb. 15—Insurance, $10; Feb. 16—Gas and electricity, $7.59; Feb. 18—Grocery bill, $50.48; Feb. 24—Dress, $18.98; Feb. 27—Savings $75.

4. Received: April 4—Salary, $50; April 11—Salary, $50; April 18—Salary, $50; April 25—Salary, $50. Paid: April 6—Church, $1.50; April 8—Groceries, $10.49; April 9—Gas and electricity, $8.38; April 10—Savings, $50; April 13—Church, $1.50; April 15—Groceries, $12.85; April 16—Shoes, $6.98; April 17—Red Cross, $10; April 20—Church, $1.50; April 21—Groceries, $14.50; April 22—Coat, $39.98; April 27—Church, $1.50; April 29, Groceries, $13.98.

The Murrays' Budget

The Murray Budget	
House Payment	$85
Food	65
Clothes	50
Gas, Light, Telephone	12
Other Expenses	60
Savings	78
	$350

The Murrays keep a **budget** to show them their monthly expenses and how much of Mr. Murray's monthly salary of $350 can wisely be spent for each item of expense.

1. Which of the Murrays' budget expenses would be about the same each month?

2. Compare the Murray budget with Mr. Murray's account for December. Which expenses kept within the budget? Which did not?

3. If the Murrays have a dentist bill, a basketball game to pay for, and a church contribution, under what heading could they be included?

4. Ann's father earns $300 a month. His budget shows he plans to use $\frac{1}{5}$ of his salary for rent, for food, $\frac{1}{6}$ for clothing, $\frac{1}{10}$ for heat and light, and for savings. How much money is left for other expenses? Make a budget for Ann's father.

5. Make a budget to show that Mr. Taylor plans to use $\frac{1}{4}$ of his monthly salary of $280 for rent, for food, $\frac{1}{7}$ for clothing, $\frac{1}{10}$ for heat and light, and for savings. Don't forget to show a sum for other expenses.

A Savings Account for Bill

"I'll open a **savings account** at the bank and make sure I save each month," decided Bill.

At the bank, Bill filled in a **deposit slip,** showing his name, the date, and the amount of money he wanted to **deposit** or put in the bank.

Account No. 541 Date Dec. 1, 19....

DEPOSITED IN
LINCOLN SAVINGS BANK....
SEATTLE, WASH.

TO THE CREDIT OF
William Murray
3945 Western Avenue
Seattle, Washington

BILLS	1	00
COIN	1	00
CHECKS		
List checks separately		
TOTAL	2	00

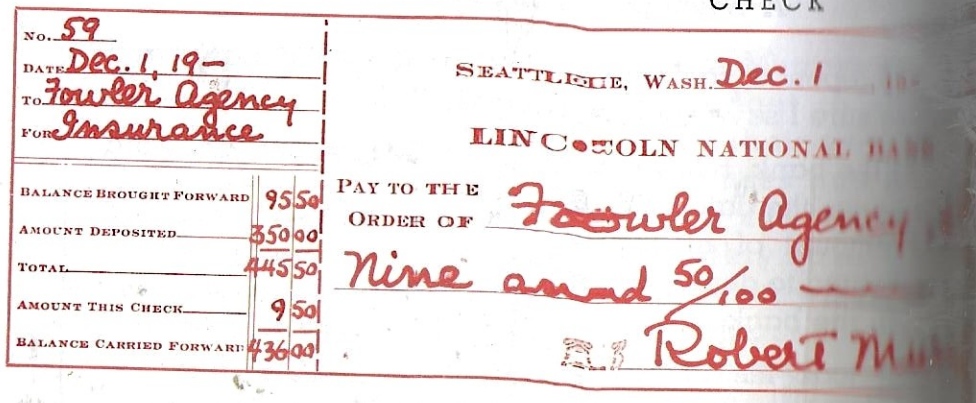
Bill took his money and the deposit slip to the bank **teller** standing at a window marked **Savings Accounts.** The teller counted Bill's money and checked to see that the deposit slip was correct.

Bill was then given a **bankbook** on which were his name and savings-account number. In the bankbook the teller wrote, "Dec. 1, $2.00." He gave the bankbook to Bill as a record of his deposit, and kept the deposit slip for the bank's record.

1. Make some deposit slips like the one on this page. Fill a slip for each of these deposits, using your name as the depositor: Jan. 1: $18 in bills and 85¢ in coin; Mar. 30: 1 five-dollar bill, 6 one-dollar bills, fifty cents, a quarter, and a dime.

STUB

CHECK



Mr. Murray's Checking Account

When Mr. Murray receives his salary, he deposits it in his **checking account** at his bank. He has a bankbook to show deposits, and a **checkbook**, which is a book of bank **checks and stubs.** When money is needed or a bill is to be paid, Mr. Murray makes out a check.

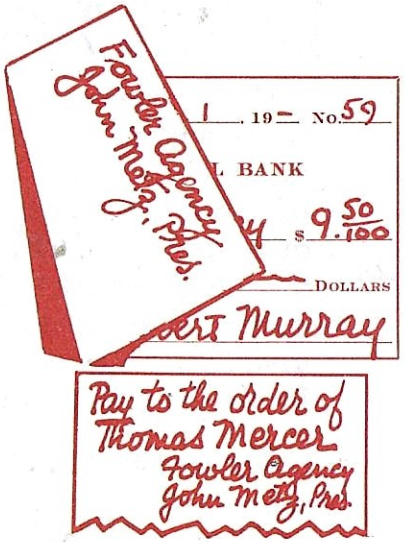
Look at the check Mr. Murray made to pay his insurance on December 1. At the left of the check Mr. Murray filled in the stub as a record of his account and check. Then, he tore the check off and kept the stub in his checkbook.

1. What six facts are written in the check?

2. What does the stub show now?

3. From where do you think "Balance Brought Forward" comes? Where will "Balance Carried Forward" go?

The owner of the Fowler Agency took Mr. Murray's check to the bank. There he could do one of three things with the check.



1. To receive payment, he could endorse the check by writing the name of the agency and his own name across the back at the left end.

2. If the Fowler Agency wanted to use the check to pay Thomas Mercer, he could endorse it this way:

3. The check could be deposited in the Fowler Agency bank account by writing "For deposit" on the back, followed by the name of the agency. In filling out a deposit slip for this deposit, where should the amount be listed?

4. From whose account is the amount of the check subtracted? Would this be true no matter which of the three ways the Fowler Agency used the check?

5. On Sept. 5, you write check No. 76 paying Helen Foster $85.50 for rent. Show its endorsement (a) for payment; (b) for payment to another; (c) for deposit.

Money Orders

In Bill Murray's birthday mail, there was a money order for $15 from Uncle Joe.

Money orders are issued by the United States Post Office so that we can safely send or receive money through the mails. To send the money order, Uncle Joe went to the post office, made out an application, and gave the clerk the amount of money he wished to send. The clerk then filled in a money order blank, putting in the amount of money Uncle Joe wanted to give Bill. He gave one part of this money order to Uncle Joe and kept the other for the post office.

The post office charges these fees for money orders:

	Fee
$.01 to $5	10¢
$5.01 to $10	15¢
$10.01 to $50	25¢
$50.01 to $100	35¢

1. What was the fee for sending Uncle Joe's money order?

Mr. Murray told Bill he could have the money order turned into cash by taking it to any post office or to the bank and signing it.

2. Appoint a classmate to get an application blank for a money order at the post office. Fill it in for Uncle Joe's present to Bill.

3. Counting fees, what is the cost of the following money orders? $58.61 $4.99 $35.80 $8.59

4. Telegraphing and expressing money are two other ways to send or receive money. Find out about these by visiting telegraph and express offices.

Monthly Bills, or Statements

Phone 3-5261

KNIGHT DEPARTMENT STORE
249 Oak Street
SEATTLE, WASH.

Sold to: Mrs. Robert Murray
3945 Western Avenue
Seattle, Wash.

June 1, 19

DATE	ITEMS	AMOUNT
Apr. 30	Brought Forward	12 98
May 6	2 chair @ 47.89	95 78
May 19	1 bridge lamp	18 95
May 27	1 set of dishes	40 00
	Total	167 71

Here is the **bill** or **statement** the Murrays received from the Knight Department Store. It showed what they had bought and how much they owed for May.

1. Under which heading is each of the following shown: dates purchases were made; articles bought; amount of each purchase; the total amount due?

2. The sign @ means "at." Explain, then, the second line in the statement.

3. What other facts appear on the bill?

4. Is the amount Mr. Murray has to pay correct?

5. Make a statement for this August bill owed by John R. Davis, 413 Adams Street, Rochester, New York, to the Good Times Company, Portland, Maine: July 3, two pairs of baseball shoes @ $19.80; July 14, 1 can of shoe dressing, 25¢; July 19, one baseball bat $2.90; July 28, one first base mitt, $11.45; July 30, two catchers' mitts @ $14.95.

Fun Writing Checks

Using the model shown on page 82, make ten play bank checks, together with their stubs.

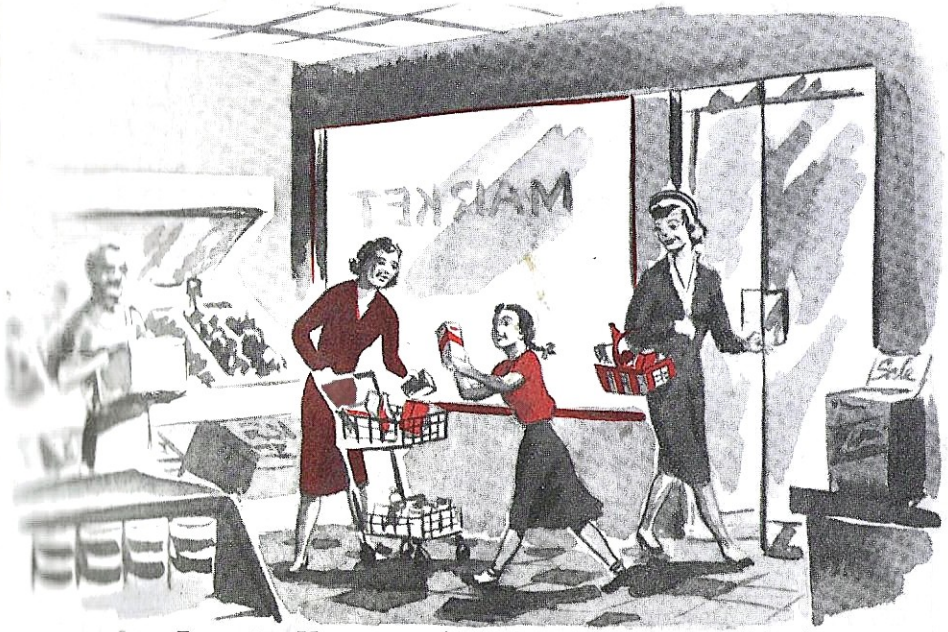
Remember: Never sign your name on a real check of a bank where you have no checking account. It is against the law.

Make these payments, using your checking account. Begin your first stub with a balance of $15.38 and a deposit of $120.50. Number your checks in order, beginning with No. 64.

1. Mar. 1: To James Manton, $65.50 for rent.

2. Mar. 15: You deposit in your checking account $45.00 and pay the Acme Supply Company $25.75 for plumbing fixtures.

3. Apr. 3: You deposit $8.95 in your checking account and pay $12.45 for Dr. Abrams' services.



4. Apr. 8: You pay $15.28 to the Bower Market for groceries.

5. May 2: You deposit $34.00 in your checking account and pay $100.00 as the first payment on a television set from Knight Bros.

6. June 7: You deposit $75.75 and pay $10.50 for a sports jacket from Lowe and Stuart Company.

7. June 30: You pay Amber and Company $3.75 to have your tennis racket restrung.

8. July 9: You buy some American folk-song records for $6.89 from The Record Corner.

9. July 28: You deposit $65.25 in your checking account and pay Happy Kennels $25.00 for that dog you have wanted.

10. Aug. 1: You give the Salvation Army a contribution of $15.00.

Sales Slips

At his uncle's store one day, Bill made out an order to be sent to Mrs. Thomas Shore **C.O.D.**, or "cash on delivery."

PURE DRUGS CO.

Seattle, Wash., Nov. 20, 19–

Sold to: Mrs. Thomas Shore
9831 Bay Street

Clerk No.	Ordered by	Amount Received
2	Phone	

Quantity	Description	Amount
1 jar	Cold cream	1 25
4 bars	Soap @ 10¢	40
1 can	talcum powder	75
1 box	face powder	2 10
		4 50
Paid Nov 20 WM		

Bill made out this **sales slip**, making a second copy at the same time by using carbon paper. The store kept the first copy; the carbon copy was for Mrs. Shore.

Mrs. Shore paid on delivery. Bill **receipted** the carbon copy of the sales slip by writing on it, "Paid" with the date and his initials.

1. What information do you find on this sales slip?

2. Would Bill need the name and address of a customer who paid cash and took her purchases with her? Why?

3. Should Bill always have the name and address on a sales slip when orders are to be delivered? Would this be true whether the order is paid for at the store, sent C.O.D., or **charged** and paid for later?

4. Make out a sales slip you might receive for buying four different articles at a department store in your town.

Show that You Know

1. Make and balance this cash account for Jim Brady: Cash on hand Oct. 1, $3.54. Received $1.60 monthly allowance on Oct. 2. Spent 54¢ for bicycle light on Oct. 3. Sold roller skates for 30¢ on Oct. 5 and a model airplane for 55¢ on Oct. 11. Spent 45¢ on a movie on Oct. 15, gave 25¢ to his sister on Oct. 19. Received 35¢ for cleaning cellar on Oct. 30.

2. Make a time budget showing how you might spend 24 hours of a day. Allow time for schoolwork, other work or hobby, meals, play, sleep, and bathing.

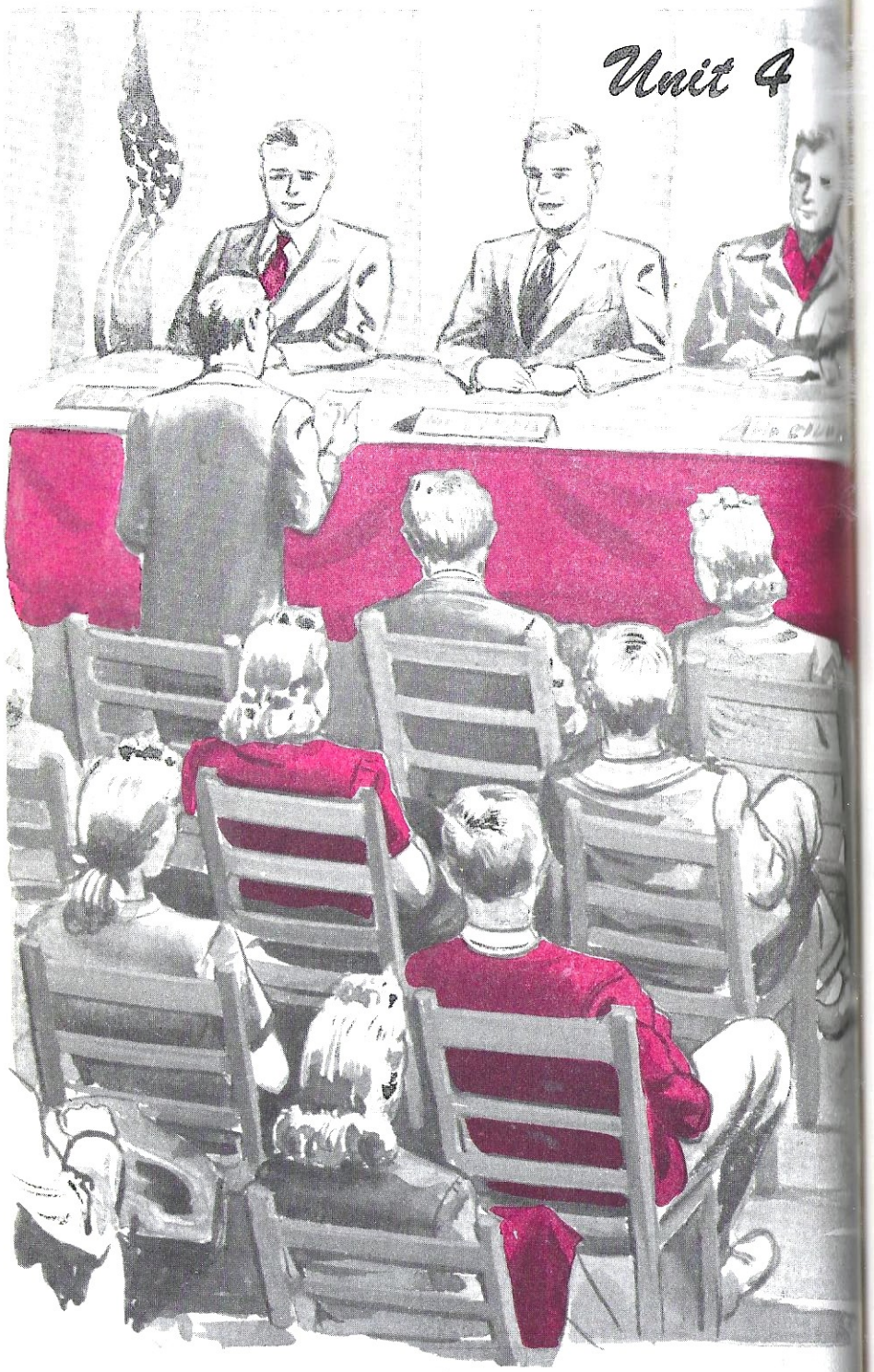
3. Make a blank copy of the deposit slip on page 81. Using yourself as the depositor, show that you are depositing twenty-four dollars and sixty cents and a check for fifty-eight dollars from a Wayne, Indiana, bank.

4. What is the fee on a money order for $98.95?

5. How is a check to you endorsed for payment? For payment to another? For deposit?

6. Make a sales slip showing you bought five things in a hobby store and paid C.O.D.

7. Using the form on page 85, make out Mrs. Murray's February statement from Cooper Sons. Show the following: Jan. 31, balance due, $9.67; Feb. 3, bedspread, $17.89; Feb. 12, toaster, $13.49; Feb. 21, goblets, $4.95; Feb. 27, 6 towels, at $1.79.



America's Gift of Government

We live under a **democracy**, or a "government of the people, by the people, and for the people." You can see, in this picture of a town hall meeting of American citizens, an example of democracy in action. To a far greater degree than most governments in the world, American democracy respects the rights and the value of the individual. Can there be a more splendid gift than this?

Here is a table of the basic salaries paid each year to high officials of the United States:

President	$100,000
Vice-President	30,000
Speaker of the House	30,000
Chief Justice, Supreme Court	25,500
Associate Justices (8)	25,000
Cabinet Members (9)	22,500
Secretary of the Army	18,000
Secretary of the Navy	18,000
Secretary of the Air Force	18,000
Senators (96)	12,500
Representatives (435)	12,500

1. Find the total salaries paid to Cabinet Members. To Associate Justices. To Senators. To Representatives.

2. Including the totals you found for Exercise 1, what is spent yearly for salaries to the high officials listed here?

3. Use reference books to find what salary is paid to other high officials in our government. Add them to your total of Exercise 2.

Recalling Decimals

The word **decimal** comes from a Latin word meaning *ten.*

Let's study the number **2222.** The first **2** at the right shows **2 ones** or **2 units.** The **2** in the next place to the left shows **2 tens.** The third **2** shows **2 hundreds,** and the fourth **2** shows **2 thousands.**

$10 \times 2 = 20$ $10 \times 20 = 200$ $10 \times 200 = 2000$

You see that going from right to left, each place to the left stands for ten times the value of the place just before it.

In our number system, we write a **decimal point** after the units figure; and each place to the right of the decimal point has ten times **less** value than the one before it to the left.

$1 \div 10 = \frac{1}{10}$ or .1 $\frac{1}{10} \div 10 = \frac{1}{100}$ or .01

$\frac{1}{100} \div 10 = \frac{1}{1000}$ or .001

1. Study the place name and the place value of each figure in this chart. Then, tell what each figure shows. Begin at the decimal point, going first to the left, then to the right.

Whole Number							Decimal Point	Decimal					
5	5	5	5	5	5	5	.	5	5	5	5	5	
Millions	Hundred-Thousands	Ten-Thousands	Thousands	Hundreds	Tens	Units	Decimal Point	Tenths	Hundredths	Thousandths	Ten-Thousandths	Hundred-Thousandths	Millionths

The last place in a decimal gives the name of the decimal. .276 is read **two hundred seventy-six thousandths.** .0024 is read **twenty-four ten-thousandths.**

1. Read: .8 .042 5.306 .4268 3.008160

In comparing the size of decimals, first compare the figures in the highest place—the first place to the right of the decimal point. .5 is larger than .18 because 5 tenths is larger than 1 tenth. In comparing .24 and .213, each decimal has 2 tenths; so we compare the figures in the next highest place. .24 is larger than .213 because 4 hundredths is larger than 1 hundredth.

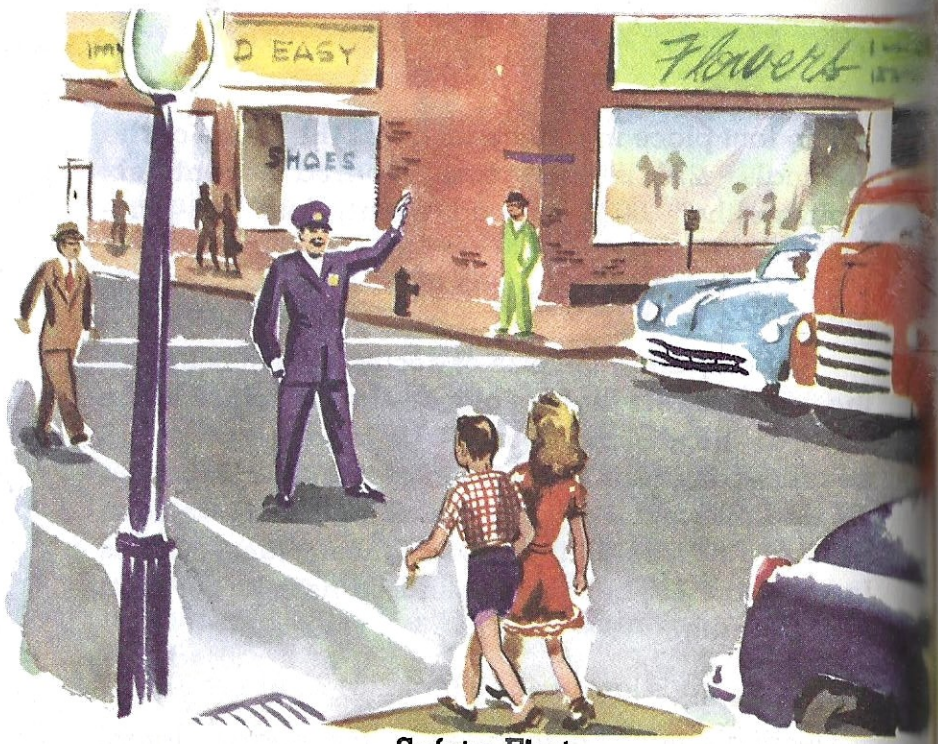
2. Which is larger: .1997 or .234? .014 or .0147?

Decimals may be rounded to the nearest tenth, hundredth, or thousandth.

In rounding a decimal to the nearest tenth, if the figure in hundredths' place is 5 or more, call it 1 tenth and increase the tenths' figure by 1, dropping all figures to the right of tenths' place. If the figure in hundredths' place is less than 5, drop all figures to the right of tenths' place. Use this same plan in rounding decimals to the nearest hundredth and the nearest thousandth.

.2835 rounded to the nearest thousandth is .284; to the nearest hundredth, .28; to the nearest tenth, .3.

3. Round these decimals to the nearest tenth, the nearest hundredth, and the nearest thousandth: .7485, .09127, .5555, .70812, 1.0775, 5.9801.



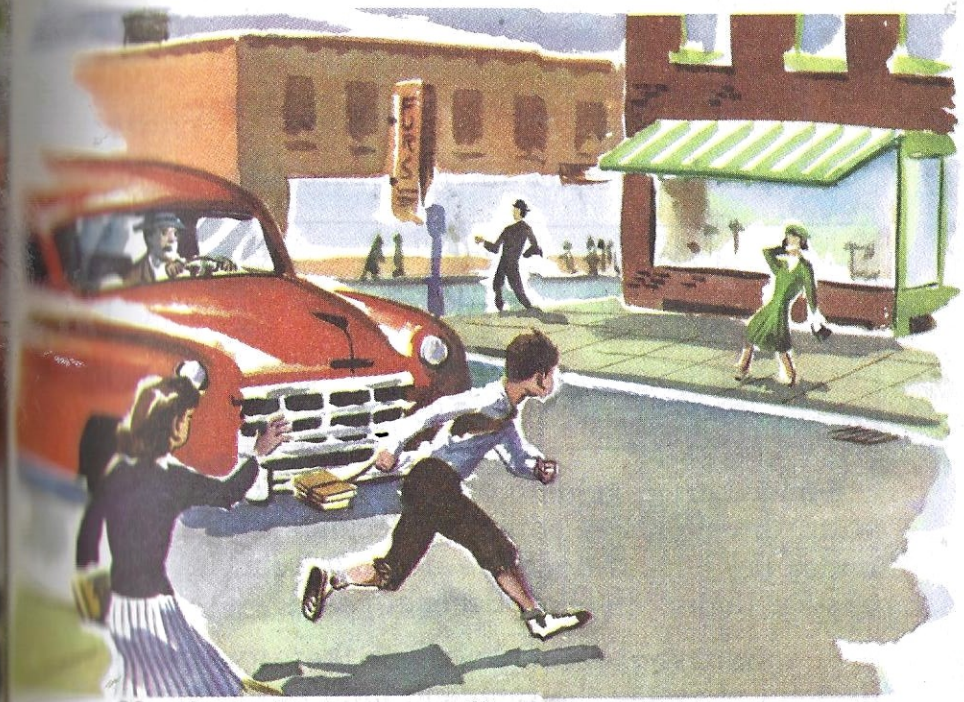
Safety First

Let's suppose a man is driving his car. Suddenly a child runs into the road. The time the driver takes to jam on his brakes is his **reaction time.** Average reaction time for drivers is $\frac{3}{4}$ second.

1. A car running at 30 miles an hour travels 44 feet in one second. How far will it go before the average driver's brakes can be applied?

Even the best brakes take time to stop a car. Tests show that at 30 miles an hour, with good brakes and on a dry road, a car will travel 47 feet before stopping.

2. Add this 47 feet to the 33 feet before the brakes take hold and tell how far the



30-mile-an-hour car will travel before stopping.

3. At 40 miles an hour, the stopping distance is 128 feet. How much farther will a 40-mile-an-hour car travel out of control than a 30-mile-an-hour car?

4. At 50 miles an hour, a car will not stop till it has gone 186 feet. Find out what part of your school block 186 feet is.

5. At 60 miles an hour, the good car with an average driver, good brakes, and on a good road will travel 251 feet before it can be stopped. Sixty miles an hour is twice as fast as 30 miles an hour. How many times farther will a car driven at 60 miles an hour travel before stopping than a car driven at 30 miles an hour?

Adding and Subtracting Decimals

Study these examples and make sure each is right.

4.739	1.474	64.000
86.65	−.578	−.329
3.894	.896	63.671
+69.94		
165.223		

Remember: In adding and subtracting decimals, write the numbers with the decimal points one under the other. Place the decimal point in your answer under the other decimal points.

In subtracting decimals, when there are fewer decimal places in the minuend than in the subtrahend, write zeros to the right of the minuend to give it as many decimal places as the subtrahend. Then subtract.

Adding or taking away zeros to the right of a decimal, you know, does not change the value of the decimal.

Add and check.

	a	b	c	d
1.	5.27	959.75	526	197.6
	.6300	26.8	57.3	215
	1.008	799.98	674.84	143.8
	23.4	244.8	27.9	188.7
		.69	338.59	150.3

More practice on page 370.

Subtract and check.

	a	b	c	d
2.	1.067	147.21	7	1677
	.945	65.5	.639	894.17

Add and check.

3.	8.62	96.93	.682	87.076
	.223	79.5	4.15	98.58
	7.58	5.94	.9414	.809
	.759	24.9	4.989	46.07
	5.13	37.86	.5600	.677

Subtract and check.

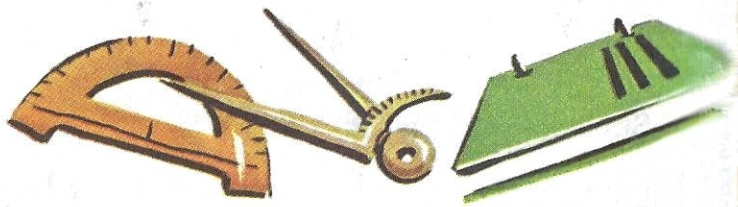
4.	939.8	393.3	1.1646	10.397
	162.63	24.61	.9171	4.758
5.	6.2627	45.022	1566.14	192.9
	2.7537	31.89	500.32	98.655

6. Mr. Webster's lot is 132.05 ft. long and 65.76 ft. wide. How much greater is its length than its width?

7. Workmen are paving a street 1 mile long. When they have finished 1025.5 ft., how many more feet must they pave?

8. We live on a corner lot. It is 59.72 ft. on Warren Street and 72.15 on James Street. How much longer is the James Street side?

More practice on page 371.



Think Before You Figure

When given a problem, some boys and girls start right in to add, subtract, multiply, or divide the numbers before they think clearly about what they are to do. As a result, they are very likely to do much unnecessary work and then get the wrong answer.

Maybe you don't believe this? All right. Let's take two problems and see.

1. Volume I and Volume II of a series of books are set side by side on a shelf in the usual order. Each book has a thickness of two inches of paper pages, and each cover is $\frac{1}{16}$ of an inch thick. How far is it from page 1 of Volume I to the last page of Volume II?

Go ahead. Work it out. What answer do you get?

Most students would say that the answer is $4\frac{1}{8}$ inches. Was that your answer? Some would say that it is $2\frac{1}{8}$ inches. Did you get that? If you did, you didn't think very well. Where does page 1 of Volume I come? It's on the right-hand side of Volume I, isn't it? Where does the last page of Volume II come? It's on the left side of Volume II. There's nothing between those pages but the covers. So the answer is $\frac{1}{8}$ of an inch. Did you think that one through correctly?

2. Two runners start at the same time from opposite ends of a road 13 miles long. One runs steadily at 7 miles an hour; the other, at 6 miles an hour. Just as they start, a fly takes off from the nose of the 7-mile-an-hour runner and flies at a steady rate of 30 miles an hour until he reaches the other runner. Then he flies back to the first runner, back to the second, and back and forth between them as they approach each other. If the fly keeps up his steady rate of 30 miles an hour, how far does he fly before the runners meet?

Try that one. There are a lot of numbers to use. You might even try drawing a diagram of the back-and-forth flight of the fly, with each line getting shorter as the runners approach each other. Or . . . oh, it's no use! What a terribly confusing example!

Let's stop and think about it before we are drowned in figures. How long is that road? 13 miles. How fast are the boys approaching each other? 7 miles plus 6 miles equals 13 miles an hour. How long does it take them to meet, then? Why, just one hour. How fast is the fly flying during that hour? 30 miles an hour. Then what's the answer? Why, 30 miles, of course!

So it was easy, after all. You could do it in your head, without drawing that diagram or writing down any numbers at all. What made it so easy, all at once? Just thinking—clear thinking, first.

Multiplying Decimals

There is one thing to learn about multiplying decimals. Make very sure you know it.

In multiplying decimals, point off in the product as many decimal places as there are in both the multiplicand and the multiplier.

Study each of these examples. Tell what is multiplied by what, and explain how each answer is found.

1.	2.	3.	4.
31.26	47 6	36.5	.00 7
23	5.8	4.1 8	.9
93 78	380 8	2 9 2 0	.0 06 3
625 2	2380	3 6 5	
718.98	2760.8	146 0	
		152.5 7 0	

Remember: Sometimes it is necessary to write zeros right after the decimal point so as to make the needed number of decimal places.

Multiply and check.

	a	b	c	d
1.	6.347	.7139	.002	.015
	78	.027	3.1	.059
2.	8.09	.674	48.65	38.29
	78.4	5.69	8.76	60.9
3.	1.275	144.5	879.3	1.234
	.13	12.5	.498	.025

4. How far can you travel in 7.6 hr. at the rate of 30.8 mi. an hour?

More practice on page 372.

Dividing Decimals by Whole Numbers

This page shows you how to divide decimals by whole numbers. Study it. Then, explain how each example in the box is worked.

1. **To divide a decimal by a whole number, place the decimal point in the quotient above the decimal point in the dividend and divide.**

2. **Carry every inexact division to at least three decimal places unless told not to. Place a + sign after the last figure in the quotient if the division is still uneven.**

3. **In dividing a number by a larger number, place a decimal point after the dividend and divide, annexing zeros to the dividend as needed.**

4. **There must be a figure in each decimal place in the quotient. If there are vacant places between the decimal point and the first figure to the right of it, write a zero in each place.**

2.31	.234+	$.75	.062
8)18.48	14)3.280	24)$18.00	34)2.108
	2 8	16 8	2 04
	48	1 20	68
	42	1 20	68
	60		
	56		
	4		

Divide and prove.

1. 8.4168 ÷ 84
2. $12 ÷ 48
3. .1911 ÷ 91
4. 24.3 ÷ 25
5. 731.28 ÷ 88
6. 632.7 ÷ 671

More practice on page 372.

An Obstacle Race

First be sure and then be quick.

In military camps, men are sent to overcome obstacles as fast as possible to show their ability. Time yourself in overcoming these.

Add and check.

1.	\$15.33	\$512.50	\$24.94	\$10.70
	21.34	11.21	12.01	18.57
	13.16	414.00	20.10	64.04
	34.16	52.27	31.39	24.23
	21.04	112.02	12.10	21.25

Subtract and check.

2.	103.35	17.953	136.66	.6182
	18.4	9.338	66.3	.3582
3.	14.82	7.415	.7549	157.872
	6.047	.681	.4616	72.231

Multiply and check.

4.	94.86	80.49	.4096	7.829
	71	3.2	.96	26
5.	12.35	2.601	513.6	16.49
	.39	80.7	62	.045
6.	132.6	.3875	808.2	38.75
	.708	405	51.4	4.05

Divide and check.

7.	$22\overline{)1.958}$	$32\overline{).2496}$	$52\overline{)33.81}$	$72\overline{)7.128}$
8.	$25\overline{)24.25}$	$45\overline{)4.005}$	$66\overline{)55.44}$	$84\overline{)655.4}$
9.	$77\overline{)7.164}$	$58\overline{)27.84}$	$91\overline{)76.65}$	$48\overline{).4272}$

Work Without a Pencil

Try to work these problems without using pencil and paper. Write only the answers. When you cannot do a problem in your mind, work it on paper.

1. If 40 brushes cost \$2.40, what is the price of one brush?

2. How many quarts of oil will a 15-gallon can fill?

3. To the product of 7×9, add the sum of $7 + 9$.

4. If a car uses a gallon of gasoline every 16 mi., how many gallons will be needed to go 80 mi.?

5. Find the cost of 240 roses at \$2.00 a dozen.

6. How many packages of a dozen each can be made from 156 Easter cards?

7. A whale weighed 150,000 lb. How many tons did it weigh?

8. Find the average of the following spelling marks: 60, 80, 90, 90.

9. Mrs. Kent asked the butcher for a $5\frac{1}{2}$ lb. roast. The roast he cut weighed 4 lb. 11 oz. How many ounces less was this than Mrs. Kent asked for?

Multiplying and Dividing Decimals by 10, 100, and 1000

The quick way to **multiply** decimals by 10, 100, and 1000 is to move the decimal point one place to the **right** for each zero in the multiplier, annexing zeros if necessary.

The Decimal Way

$10 \times 10.5 = 105.$ $\quad 100 \times 10.5 = 1050.$ $\quad 1000 \times 10.5 = 10500.$

The Working Way

10.5	10.5	10.5
10	100	1000
105.0	1050.0	10500.0

1. Multiply by 10, 100, and 1000, using the decimal way: .83; .6; 3.02; .005; 16.75; .075.

In dividing whole numbers by 10, 100, and 1000, first place a decimal point after the whole number. The quick way to **divide** either a whole number or a decimal by 10, 100, and 1000 is to move the decimal point one place to the **left** for each zero in the divisor, inserting zeros if necessary.

The Decimal Way

$367 \div 10 = 36.7$	$367 \div 100 = 3.67$	$367 \div 1000 = .367$
$.315 \div 10 = .0315$	$.315 \div 100 = .00315$	$.315 \div 1000 = .000315$

2. Divide both 367 and .315 by 10, 100, and 1000 the working way to prove the decimal answers.

3. Divide by 10, 100, and 1000, using the decimal way: 26; .6; 4.15; .75; 829; 3.045.

More practice on page 372.

Dividing by Decimals

The easiest way to divide by a decimal is to make it into a whole number.

Suppose you want to divide the whole number 8 by .05.

$8 \div .05 = ?$

$.05 = 5$ hundredths.

Write a decimal point after the 8. Then multiply both .05 and 8. by 100 by moving each decimal point two places to the right. Mark these new positions by carets. Divide.

$$.05_\wedge\overline{)8.00_\wedge}\quad \begin{array}{r} 160. \\ \hline \end{array}$$

$8 \div .05 = 160$

Place a decimal point in the quotient over the caret in the dividend.

To check the place of the decimal point in your quotient, subtract the number of decimal places in the divisor from the number of decimal places in the dividend. The difference should equal the number of decimal places in your quotient.

Now work the same way to understand dividing a decimal by a decimal.

$1.4_\wedge\overline{)3.9_\wedge2}$ $\quad \begin{array}{r} 2.8 \\ \hline \end{array}$	$.62_\wedge\overline{)3751.00_\wedge}$ $\quad \begin{array}{r} 6050. \\ \hline \end{array}$	$.013_\wedge\overline{).808_\wedge6}$ $\quad \begin{array}{r} 62.2 \\ \hline \end{array}$
28	372	78
112	310	28
112	310	26
	0	26
		26

Divide and prove.

1. $.06\overline{)48}$ $\quad .7\overline{)644}$ $\quad .15\overline{)4536}$ $\quad .125\overline{)5.}$

2. $2.1\overline{)1.319}$ $\quad .34\overline{)19.89}$ $\quad 8.25\overline{)640.2}$ $\quad .366\overline{)1.741}$

More practice on page 373.

Time Across Our Country

At 8:45 A.M. Mr. Bill Thorne rushed into his New York City office and snatched up the phone. "Operator, I have three calls to place at once. Please rush them through." Mr. G. H. Hines in Minneapolis, Mr. Albert Bennet in Denver, and Mr. I. H. Henry in California were the three for whom the calls were placed.

"Mr. G. H. Hines on the line," said the operator at exactly nine o'clock in New York City.

1. What was Mr. Hines doing when his phone rang? Was his clock wrong? Consult the map and explain.

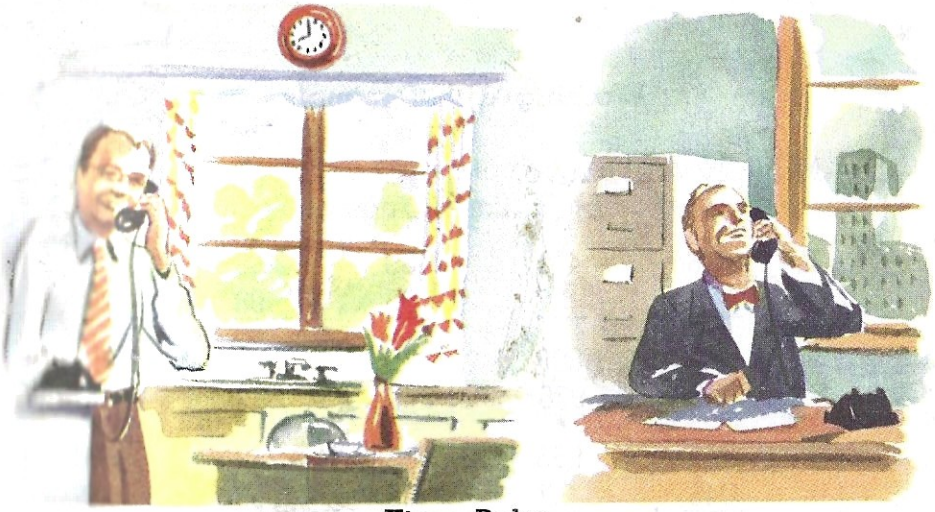
2. At 9:15 New York time, Mr. Bennet stuck his head out of the shower and called to his wife, "Please answer the phone!"

"It's a business call."

"No one does business at this hour. Who is it?"

"New York City calling."

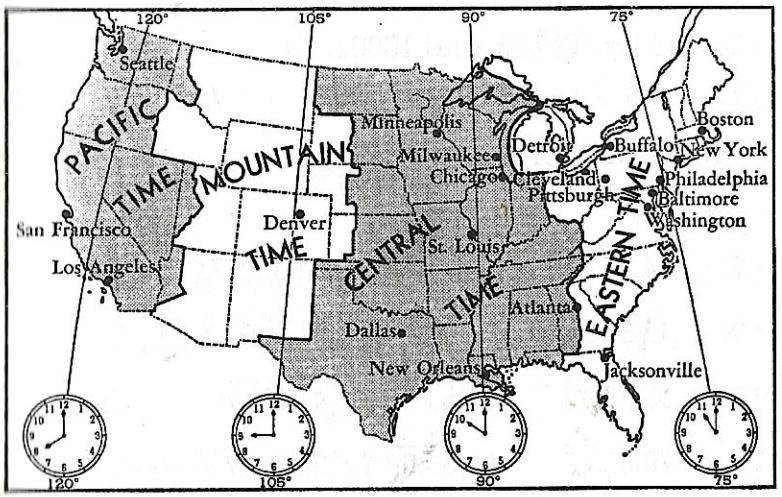
"Oh, that explains it!" What did Mr. Bennet mean?



Time Belts

3. When Mr. Henry's phone buzzed and buzzed, what was Mr. Henry doing? Was he lazy? What were most Californians doing at that time?

Can you see why Mr. Thorne chuckled when the operator said, "No response on your California call"?



Working with Decimals

Multiply and prove.

	a	b	c	d	e
1.	21.6	.411	5.39	30.8	6.89
	34	52	95	98	76
2.	5.23	.809	3.76	45.9	7.09
	798	976	879	689	934
3.	432	865	403	718	689
	.046	6.7	.32	.059	5.8
4.	76.9	2.64	.430	93.7	8.74
	8.97	69.8	7.27	.462	2.79
5.	41.91	83.76	68.9	346.8	8.04
	7.6	.86	2.37	.58	9.84

Multiply by 10, 100, and 1000.

6.	.099	7.12	.152	3.47	52.8

Divide by 10, 100, and 1000.

7.	6.5	.087	14.65	71.1	195.7

Divide and prove.

	a	b	c	d
8.	$4\overline{)27.6}$	$31\overline{).2883}$	$53\overline{).0371}$	$87\overline{)417.6}$
9.	$.42\overline{)504}$	$2.4\overline{)180}$	$7.1\overline{)2627}$	$5.4\overline{)2862}$
10.	$.05\overline{).0049}$	$.85\overline{)5.355}$	$4.12\overline{)3.7}$	$.94\overline{).2726}$
11.	$76\overline{)356.7}$	$.93\overline{)65.08}$	$31.6\overline{)6.7}$	$8.9\overline{)9853}$

Exercising Your Mind

Write only the answers to these examples. Then, work them, using your pencil. Find how many were correct the first time.

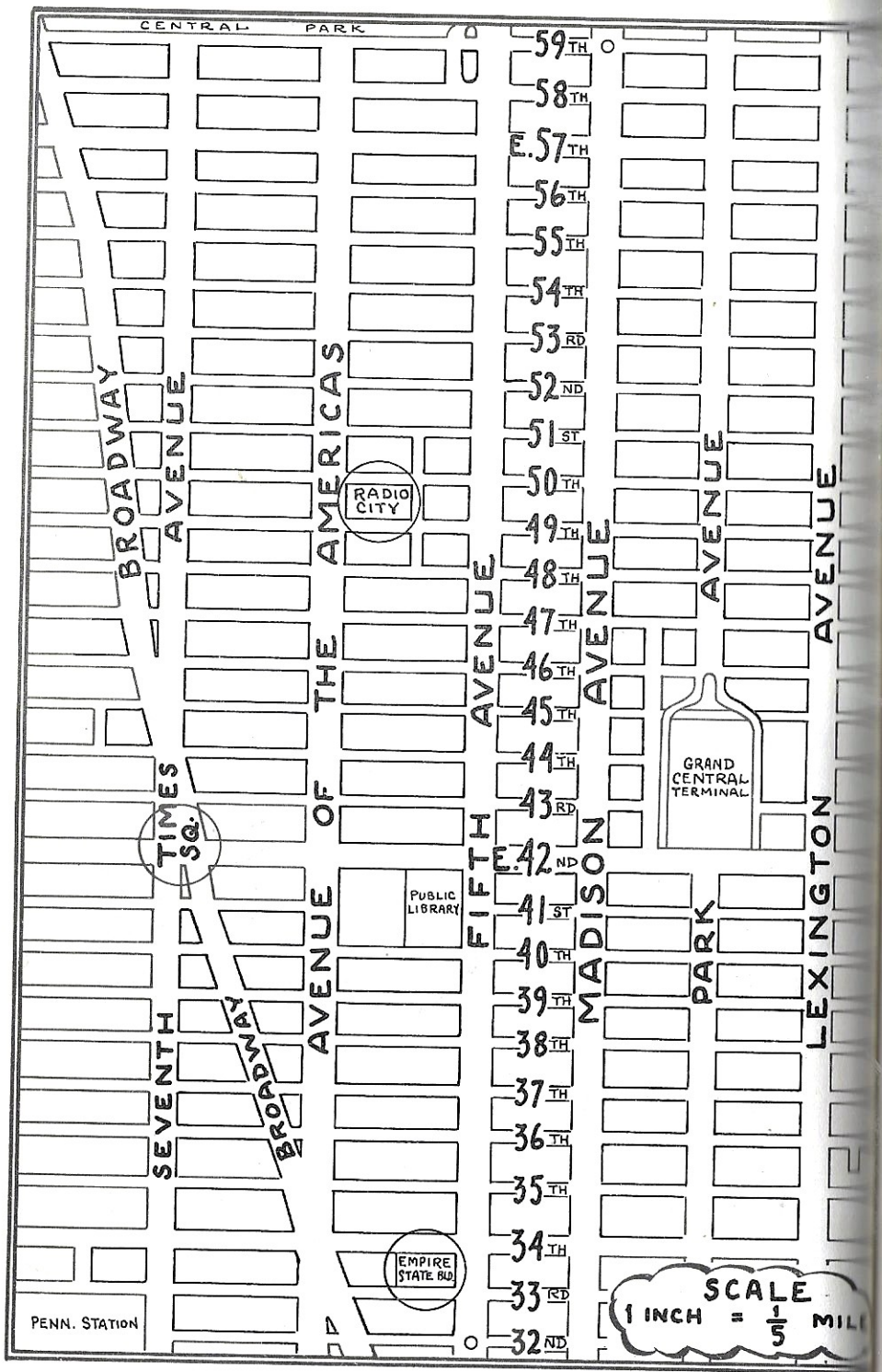
	a	b
1.	$24\div4+6-5\times3=?$	$56+8\div8-8\times4=?$
2.	$18-7+11\div2\times15=?$	$31+30-1\div3\times8=?$
3.	$12\times4\div6+2-5=?$	$6\times13-6\div8+9=?$
4.	$16-4\times3+9\div5=?$	$17\times2+4\div2-4=?$

Which is the right answer to each of these? Make an estimate; then, work each example.

5.	$54+70+39=$(189, 163)	$741\times9=$(6669, 669)
6.	$341-39=$(302, 309)	$360\div6=$(66, 166, 60)
7.	$\frac{2}{3}\times\frac{1}{2}=(\frac{1}{2}, \frac{1}{6}, \frac{1}{3})$	$2\frac{1}{4}\times4=(9, \frac{1}{9}, 2\frac{1}{16})$
8.	$3\frac{1}{5}+\frac{4}{5}=(4, 3\frac{3}{5}, 3\frac{1}{5})$	$6\frac{4}{7}-3\frac{1}{7}=(3\frac{5}{7}, \frac{3}{7}, 3\frac{3}{7})$
9.	$8\frac{2}{5}-\frac{3}{5}=(8\frac{1}{5}, 7\frac{4}{5}, 7\frac{2}{5})$	$5\frac{5}{9}-2\frac{7}{9}=(2\frac{7}{9}, 3\frac{2}{9}, 2\frac{2}{9})$

Estimate which answer is larger in each group. Then, work each example to see if you were right.

10.	32×10 or 20×15	$\frac{5}{8}$ of 56 or $\frac{4}{7}$ of 56
11.	$3.14+2.05$ or $3.41+2.50$	$\frac{3}{9}$ of 72 or $\frac{5}{8}$ of 72
12.	$.26-.14$ or $.62-.41$	$\frac{2}{3}$ of 27 or $\frac{5}{9}$ of 27
13.	41.5×2 or 4.15×2	$\frac{4}{5}$ of 45 or $\frac{7}{9}$ of 45



A Wonderful Shopping District

Here is a map of the central part of New York City. From north to south run broad avenues. From east to west run streets, numbered from south to north. Do you see that the blocks on the avenues are much shorter than the blocks on the numbered streets?

1. Picture yourself walking down Madison Avenue from 59th Street to 45th Street, and then along 45th Street to the Avenue of the Americas. Using the scale of miles, figure out how far you have walked.

2. Walk from the corner of 32nd Street and 5th Avenue north to 42nd Street and then west to Times Square. Figure how far you walk.

3. Do you see Broadway on the map, cutting across the avenues on a slant? Figure by the scale of miles how far you must walk from 32nd Street and 5th Avenue to Times Square if you go up Broadway.

4. What is the difference in length between the two ways of going?

5. If you wanted to walk from 32nd Street and 5th Avenue to Radio City, what would be your shortest way? How far would you walk?

6. Find the Empire State Building on your map. It is 1472 feet tall! If you could lay it on its side, how many blocks up the avenue from 34th Street would it extend? Find out the decimal way.

Changing Decimals to Fractions

It is easy enough to write .5 as $\frac{5}{10}=\frac{1}{2}$; .75 as $\frac{75}{100}=\frac{3}{4}$; .125 as $\frac{125}{1000}=\frac{1}{8}$.

Change to fractions: .25; .05; .10.

Suppose you want to change a decimal ending in a fraction to a fraction, what then?

$$.66\tfrac{2}{3}=\frac{66\frac{2}{3}}{100}=66\tfrac{2}{3}\div 100=\frac{\overset{2}{\cancel{200}}}{3}\times\frac{1}{\underset{1}{\cancel{100}}}=\frac{2}{3}$$

Remember: To change a decimal ending in a fraction to a common fraction, write the decimal as a fraction and divide the numerator by the denominator.

1. Change to fractions: $.33\frac{1}{3}$; $.12\frac{1}{2}$; $.16\frac{2}{3}$; $62\frac{1}{2}$.

Changing Fractions to Decimals

Now, suppose we change some fractions to decimals.

$$\frac{7}{8}=7\div 8=8\overline{)7.000}^{.875} \qquad \frac{5}{6}=5\div 6=6\overline{)5.00}^{.83\frac{1}{3}}$$

Remember: To change a fraction to a decimal, place a decimal point after the numerator and divide by the denominator, writing zeros to the right of the numerator. If the division is not exact, carry the quotient to any desired number of decimal places and write the remainder as a fraction.

2. Change to decimals: $\frac{1}{5}$; $\frac{2}{5}$; $\frac{1}{8}$; $\frac{3}{8}$; $\frac{5}{8}$.

More practice on pages 373 and 374.

Parts of a Dollar

Learning to change decimals to fractions and fractions to decimals should make very clear the table of Parts of a Dollar.

Study the table. Then, cover the fractions and tell what fraction of a dollar is equal to each number of cents.

Next, cover the cents and tell the number of cents equal to each fraction.

$50¢=\frac{1}{2}$ of \$1	$16\frac{2}{3}¢=\frac{1}{6}$ of \$1
$25¢=\frac{1}{4}$ of \$1	$83\frac{1}{3}¢=\frac{5}{6}$ of \$1
$75¢=\frac{3}{4}$ of \$1	$12\frac{1}{2}¢=\frac{1}{8}$ of \$1
$33\frac{1}{3}¢=\frac{1}{3}$ of \$1	$37\frac{1}{2}¢=\frac{3}{8}$ of \$1
$66\frac{2}{3}¢=\frac{2}{3}$ of \$1	$62\frac{1}{2}¢=\frac{5}{8}$ of \$1
$20¢=\frac{1}{5}$ of \$1	$87\frac{1}{2}¢=\frac{7}{8}$ of \$1
$40¢=\frac{2}{5}$ of \$1	$10¢=\frac{1}{10}$ of \$1
$60¢=\frac{3}{5}$ of \$1	$5¢=\frac{1}{20}$ of \$1

Change the number of cents to fractions. Find the answers.

1. At $\$.62\frac{1}{2}$ each, how much will 400 boxes of paper cost?

2. At $87\frac{1}{2}¢$ a pair, what will a dealer pay for 6 dozen pairs of stockings?

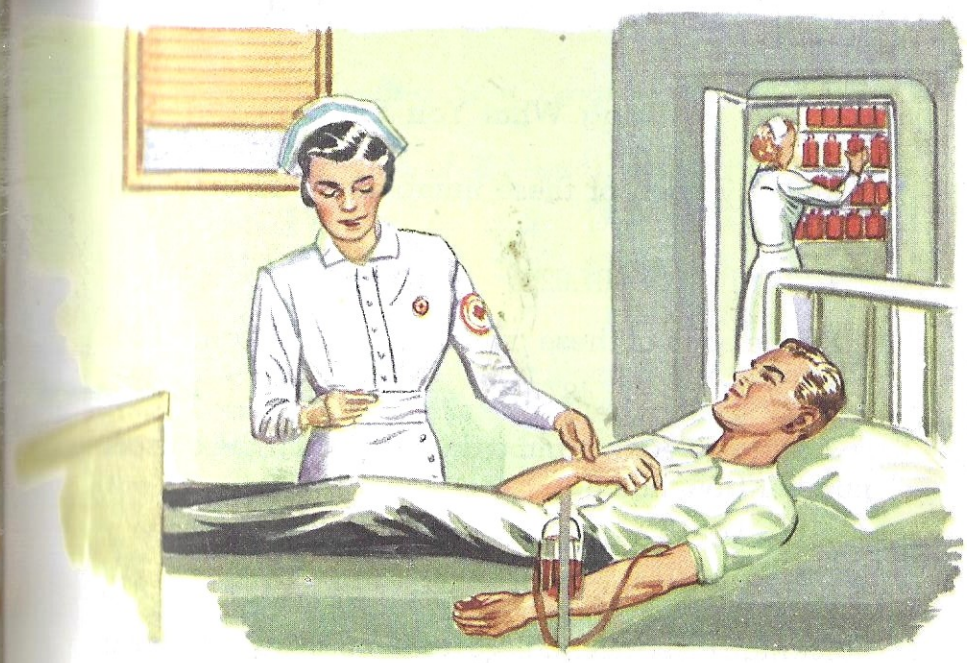
3. What will be the bill for 96 cakes of soap at $16\frac{2}{3}¢$ each and 84 boxes of bath powder at $12\frac{1}{2}¢$ each?

The Red Cross in America

The American Red Cross is always ready to help the victims of wartime or peacetime disasters, whether at home or in foreign lands.

1. The Red Cross was begun at an international conference in Switzerland in 1863. How many years ago was that? The first American Red Cross Society was begun by Clara Barton 18 yr. later. In what year was that?

2. Junior Red Cross enrollment of boys and girls in schools throughout the land is now over 19,283,000. Round this number to the nearest ten-thousand; to the nearest hundred-thousand; to the nearest million; to the nearest ten-million.



3. Blood is badly needed to help the sick and wounded both in war and peace. During a recent year, the Red Cross, through its National Blood Program, collected 567,472 pints of blood at 34 blood centers. On the average, how many pints of blood were collected at each blood center?

4. In a recent year, the American Red Cross spent $5,054,480 to help victims of disasters in America. American Red Cross aid to disaster victims in foreign lands totaled $657,249 in the same year. What was the total spent? Round the number to the nearest million.

5. Find out what was your school's latest contribution to the Junior Red Cross. What fraction of this amount came from your class?

Using What You Know

Multiply each of these numbers by 10, 100, and 1000:

1. 64.1 407.02 16.8759 1.33011

Divide each of these numbers by 10, 100, and 1000:

2. 2341.5 4877.18 301.04 1.722

3. Match each number in line A with the correct number from line B.

A. \$.50 $\frac{2}{5}$ $16\frac{2}{3}$ $\frac{5}{6}$ $\$.12\frac{1}{2}$ $.62\frac{1}{2}$ $\frac{7}{8}$ $\frac{3}{4}$ .1

B. .75 $\$\frac{1}{8}$ $\frac{1}{10}$ $\$\frac{1}{2}$ $.83\frac{1}{3}$ $\$\frac{1}{6}$ .4 $\frac{5}{8}$ .875

Change these decimals to fractions in lowest terms:

4. .34 .25 .285 .016 .375

Change to decimals, carrying each decimal to three places.

5. $\frac{4}{9}$ $\frac{7}{12}$ $\frac{5}{7}$ $\frac{2}{15}$ $\frac{7}{24}$

Work these problems first with the numbers given. Then work them again, substituting decimals for fractions or fractions for decimals.

6. Jack's model plane flew 792 feet. Express this distance as a decimal of a mile.

7. The route to the seashore by way of Hilton is 38.75 mi. long. By way of Chatham, it is 45.9 mi. What is the difference in distance between the two routes?

8. At $13\frac{1}{2}¢$ a yard, what will $14\frac{1}{4}$ yd. of cloth cost?

Testing Your Progress

1. From the sum of $23\frac{3}{5}$ and $14\frac{1}{2}$, subtract $12\frac{5}{6}$.
2. $6\frac{5}{8} \times 2\frac{4}{5} = ?$
3. 7.05 mi. = ? ft.
4. $1.419 \div 3.6 = ?$
5. $17\frac{1}{2} \div 5\frac{5}{6} = ?$
6. $\frac{7}{8} \times \frac{9}{10} \times \frac{5}{7} = ?$
7. $\frac{15}{28} = ?$ decimal

8. The primary grades collected \$67.44 for the Red Cross fund. The upper grades collected \$89.92. The second amount is how many times as large as the first?

9. Divide 2250 by 125, using the short method.

10. If there is .783 lb. of water in 1 lb. of potatoes, what is the weight of the water in a 60-lb. bushel of potatoes?

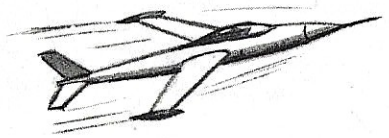
11. What is the total cost of the following: $3\frac{1}{2}$ yd. of cambric at $29¢$ a yard, $2\frac{3}{4}$ yd. of percale at $16¢$ a yard, $\frac{3}{8}$ yd. of sateen at $24¢$ a yard?

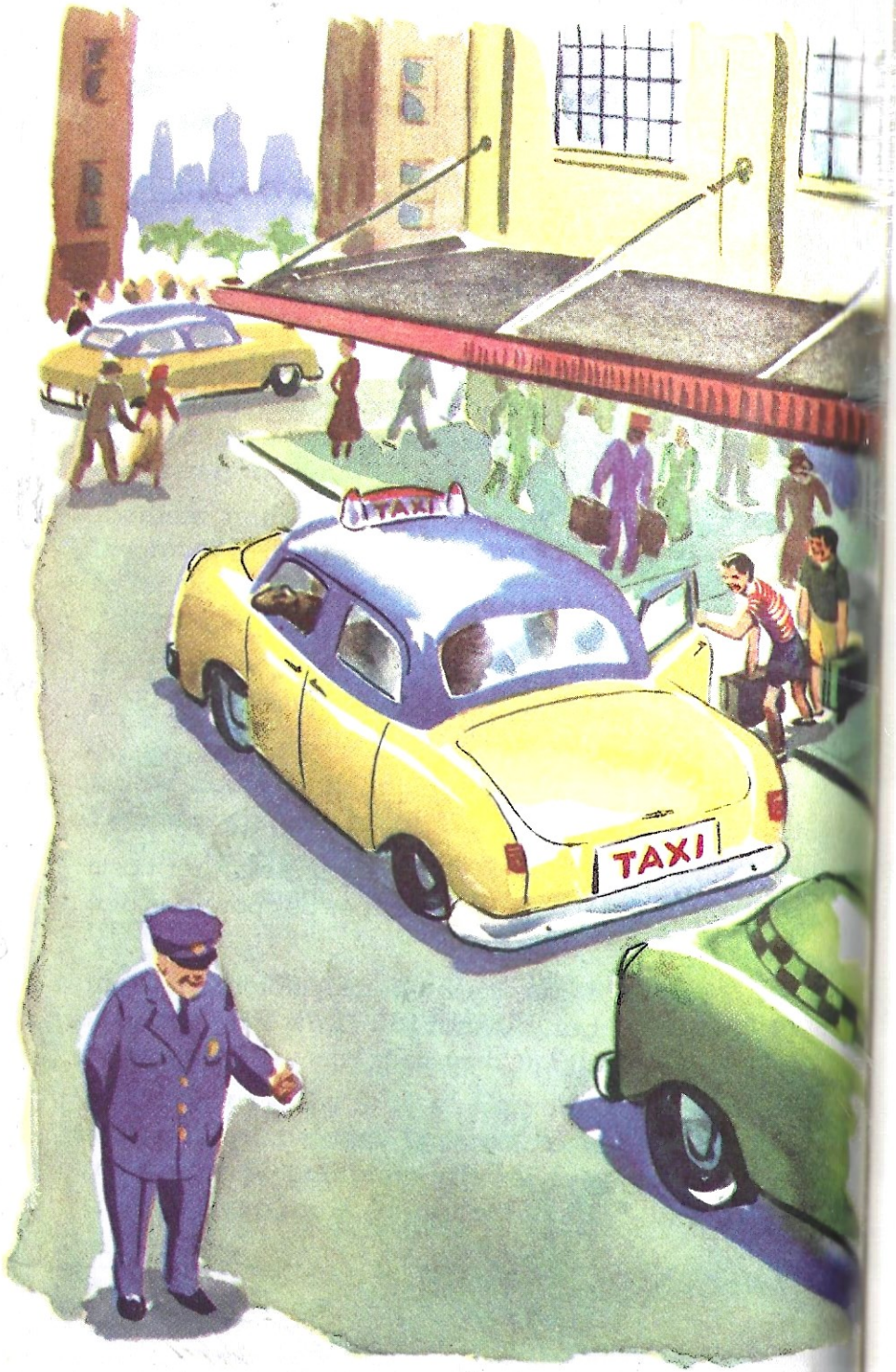
12. At $24¢$ a hundredweight, how much will a paper dealer pay for 1275 lb. of old newspapers?

13. One roast costs \$2.42 for $5\frac{1}{2}$ lb.; another costs \$3.50 for $6\frac{1}{4}$ lb. How much cheaper per pound is one roast than the other?

14. In a trial run, an outboard motorboat went 49.72 mi. per hour. At that rate, how long would it take to go 20 mi.? (Carry your answer to two decimal places.)

15. Find the total cost of sending by first-class mail packages of jewelry weighing $5\frac{3}{8}$ lb., $3\frac{1}{2}$ lb., $4\frac{3}{4}$ lb., and $\frac{3}{16}$ lb. at the rate of $3¢$ an ounce.





Riding in a Taxicab

1. A cab company charges 25 cents for the first $\frac{2}{6}$ of a mile and 5 cents for each $\frac{1}{6}$ of a mile afterwards. Find the fare for riding $1\frac{1}{2}$ miles from the State House in Boston.

2. It is two miles from the Broad Street Station to the Jefferson Hotel in Richmond. The Yellow Cab fare is 15 cents for the first $\frac{1}{4}$ of a mile and 10 cents for each $\frac{1}{4}$ of a mile afterwards. Find the cost of the round trip from the Broad Street Station to the Jefferson Hotel.

3. The Red and White Cab Company charges 25 cents for the first $\frac{1}{4}$ of a mile and 5 cents for each $\frac{1}{4}$ of a mile afterwards. Find the fare paid by a man who rode $3\frac{1}{4}$ miles.

4. The City Cab Company charges 20 cents for the first $\frac{1}{4}$ of a mile and 15 cents for each $\frac{1}{4}$ of a mile afterwards. Find the fare paid by a woman who rode $1\frac{3}{4}$ miles in a City Cab taxi. She gave the driver a five-dollar bill. How much change was due her?

5. Find the fare for riding $2\frac{1}{4}$ miles in a taxicab if the rate is 20 cents for the first $\frac{1}{4}$ mile and 5 cents for each $\frac{1}{4}$ of a mile afterwards.

6. In a certain city there are 16 blocks to the mile. How much should a cab driver charge to ride 24 blocks if his rate is 15 cents for the first $\frac{1}{4}$ of a mile and 10 cents for each $\frac{1}{4}$ of a mile afterwards?

Short Cuts in Multiplication

Let's start by recalling that the quick way to multiply a whole number by 10, 100, and 1000 is to annex one zero for each zero in the multiplier.

$10 \times 35 = 350 \quad 100 \times 75 = 7500 \quad 1000 \times 25 = 25000$

Knowing the quick way to multiply by 10, 100, and 1000 will help you in using other short cuts in multiplication.

Study these short cuts and see if you can use them.

To multiply a number by:		Because:
5, multiply by 10	and divide by 2.	$5 = 10 \div 2$
25, multiply by 100	and divide by 4.	$25 = 100 \div 4$
50, multiply by 100	and divide by 2.	$50 = 100 \div 2$
$12\frac{1}{2}$, multiply by 100	and divide by 8.	$12\frac{1}{2} = 100 \div 8$
$16\frac{2}{3}$, multiply by 100	and divide by 6.	$16\frac{2}{3} = 100 \div 6$
$33\frac{1}{3}$, multiply by 100	and divide by 3.	$33\frac{1}{3} = 100 \div 3$
125, multiply by 1000	and divide by 8.	$125 = 1000 \div 8$

Using the short cuts, multiply each of the following by 5, 25, 50, and 125:

1. 24 136 4.8 .72 .056 15.08 256.4

Using the short cuts, multiply each of the following by $12\frac{1}{2}$, $16\frac{2}{3}$, and $33\frac{1}{3}$.

2. 48 360 2.4 .156 26.4 1.44 .00072

3. Mr. Nichols earns $64.00 a week. How much does he earn in 25 wk.?

More practice on page 374.

Short Cuts in Division

The quick way to divide by 10, 100, and 1000 is to move the decimal point one place to the left for each zero in the divisor.

$315 \div 10 = 31.5 \quad 315 \div 100 = 3.15 \quad 315 \div 1000 = .315$

Knowing the quick way to divide by 100 and 1000 will help you in other division short cuts. Study these short cuts and see if you can use them.

To divide a number by:	Because:
25, multiply by 4 and divide by 100.	$\frac{1}{25} = \frac{4}{100}$
50, multiply by 2 and divide by 100.	$\frac{1}{50} = \frac{2}{100}$
$12\frac{1}{2}$, multiply by 8 and divide by 100.	$\frac{1}{12\frac{1}{2}} = \frac{2}{25} = \frac{8}{100}$
$16\frac{2}{3}$, multiply by 6 and divide by 100.	$\frac{1}{16\frac{2}{3}} = \frac{3}{50} = \frac{6}{100}$
$33\frac{1}{3}$, multiply by 3 and divide by 100.	$\frac{1}{33\frac{1}{3}} = \frac{3}{100}$
125, multiply by 8 and divide by 1000.	$\frac{1}{125} = \frac{8}{1000}$

Using the short cuts, divide each of the following by 25, 50, and 125:

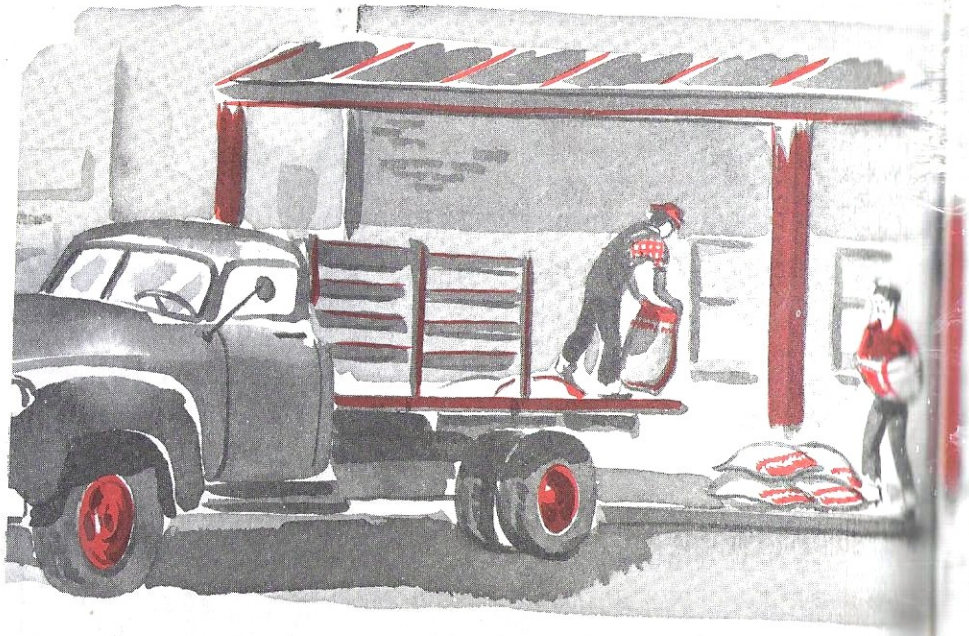
1. 45 560 1.2 .37 39.13 170.9 $812

Using the short cuts, divide each of the following by $12\frac{1}{2}$, $16\frac{2}{3}$, and $33\frac{1}{3}$:

2. 20 624 .31 5.6 3.25 61.2 $72.40

3. A certain train averaged 50 miles an hour. How many hours did it take the train to cover the distance between two cities 195 mi. apart?

More practice on page 374.



Using Short Cuts

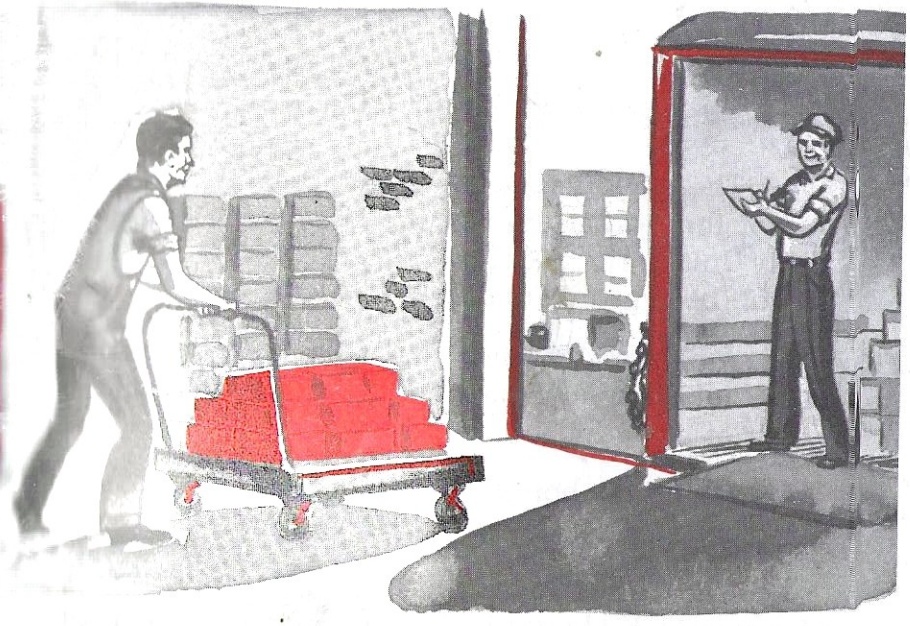
Use short cuts to find the answers.

1. A farmer brought 64.15 cwt. of potatoes to market. How many pounds of potatoes did he bring?

2. One thousand men gave $3450 to a charity fund. What was the average amount each gave?

3. Each man in a road crew worked an average of $33\frac{1}{3}$ hr. during one week. If the total number of hours worked was 900, how many men were there in the crew?

4. A shipment of stationery weighed 250 lb. in all. Each of the packages in the shipment weighed $12\frac{1}{2}$ lb. How many packages were there in the shipment?



5. Traveling at a speed of 250 mi. per hour, how long will it take an airplane to travel 2000 mi.?

6. A sewing class needed $16\frac{2}{3}$ yd. of lace to trim each costume for the spring chorus. If they bought 150 yd. in all, how many costumes could they trim?

7. One hundred twenty-five citizens each gave $75 to a children's fresh-air camp. What was the total amount given by these citizens?

8. If one carton of books weighs 36 lb., what will be the weight of 25 of these cartons? Of 50 cartons?

9. If a maid earns $24 each week, how much will she earn in 5 wk.? In 50 wk.? In 125 wk.?

10. At 48¢ a yard, what will be the cost of 5 yd. of cloth? Of 10 yd.? Of 25 yd.? Of $12\frac{1}{2}$ yd.? Of $16\frac{2}{3}$ yd.? Of $33\frac{1}{3}$ yd.?

Everyday Uses of Decimals

1. The gallon used in Canada is 1.2 times the size of the gallon used in the United States. How many United States gallons of gasoline would equal 26 gal. bought in Canada?

2. A plot of city land 256.4′ wide is to be divided into 8 lots having equal width. What will be the width of each lot?

3. Mr. Lacey bought 125 gal. of fuel oil at $.0875 per gallon. Find the total cost.

4. The Carter Construction Company built 276 rd. of concrete highway in 32 da. Find to 3 decimal places the average amount of highway built per day.

5. Mr. Carter bought 256 truckloads of gravel from Mr. Andrews. The average load amounted to 3.45 T. What was the total weight of gravel bought?

6. There are 16.5 ft. in a rod. A farmer needed 627 ft. of wire fencing and ordered it by the rod. How many rods did he order?

7. The first round-the-world flight was made by six Army Air Force men in 1924. They covered 27,534 miles in 351 flying hours. Find the average flying speed.

8. Mr. Conway raised 817.3 bu. of potatoes on 4.4 A. of land. Find to two decimal places his average yield per acre.

Show that You Know

Copy in columns and add. Check your work.

1. $8.06 + 6.57 + .25 + 3.46 + 5.71 + 3.88 + 5.39$
2. $.91 + .364 + 1.69 + .743 + 8.32 + .447 + .87$
3. $98 + 53.5 + 48 + 67.4 + 28.4 + 41 + 13.9$

Subtract and prove.

	a	b	c
4.	$.846 - .192$	$28.23 - 7.47$	$9.737 - .645$
5.	$.348 - .2836$	$369 - 3.51$	$181.7 - 64.13$

Multiply and check.

6.	75×57.84	8.9×4804	$.094 \times 8125$
7.	$467 \times .389$	9.08×97.36	76.3×610.2

Divide and prove.

8.	$.08\overline{)694}$	$43\overline{)339.7}$	$5.2\overline{)45.5}$
9.	$.94\overline{)7.299}$	$65.2\overline{)2.477}$	$.316\overline{).5933}$

Find the answers. Watch the signs.

10.	$\frac{1}{6} + \frac{3}{8}$	$\frac{9}{10} + \frac{4}{5}$	$7\frac{1}{7} \div 8\frac{4}{7}$
11.	$38 - 6\frac{5}{12}$	$12\frac{7}{8} - 6\frac{7}{12}$	$7\frac{1}{3} \div 10\frac{2}{9}$
12.	$\frac{5}{16} \times \frac{14}{15}$	$14\frac{3}{4} - 3\frac{5}{6}$	$2\frac{3}{4} + 4\frac{7}{8} + 5\frac{3}{16}$
13.	$\frac{2}{7} \times \frac{7}{9} \times \frac{3}{8}$	$8\frac{13}{20} + 9\frac{3}{5} + 7\frac{7}{8}$	$3\frac{3}{5} \times 2\frac{2}{3} \times 12\frac{1}{2}$

14. Change to decimals: $\frac{4}{7}$, $\frac{5}{16}$, $\frac{11}{12}$, $\frac{13}{24}$.
15. Find the ratio of 14 to 16; of 21 to 15; of 22 to 8.

THIS BOOK IS PRESENTED TO YOUR
SCHOOL SYSTEM FOR EXAMINATION BY
SUPERVISORS AND TEACHERS.

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